NASA CR-54622, 1968
PWA-3356

EXPERIMENTAL EVALUATION OF TRANSONIC STATORS

DATA AND PERFORMANCE REPORT MULTIPLE-CIRCULAR-ARC STATOR B

PREPARED FOR

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

CONTRACT NAS3-7614

Pratt & Whitney Aircraft DIVISION OF UNITED AIRCRAFT CORPORATION

EAST HARTFORD CONNECTICUT

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by

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EAST HARTFORD, CONNECTICUT

FOREWORD

This report was produced in accordance with NASA Contract NAS3-7614 for NASA Lewis Research Center, Cleveland, Ohio. It describes test results and calculations on the performance of the Multiple-Circular-Arc Stator B.

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I. SUMMARY

A transonic stator, having multiple-circular-arc airfoils with minimum curvature at the forward portion of the airfoil consistent with flow choking limitations, was tested over a range of flow angles and velocities. The transition point of the airfoil section was located rearward of an assumed shock location. Stator inlet flow was generated by means of an inlet guide vane and flow generation rotor. Transonic stator inlet flow was achieved at design speed, but Mach numbers were slightly lower than the design values. Measured minimum stator losses at mid-span were lower than the NASA loss correlation for comparable Mach numbers. Near the blade ends the losses increased sharply. At mid-span the stator exhibited a minimum total pressure loss coefficient, $\bar{\omega}$, of 0.056 at design speed. The inlet Mach number and diffusion factor at minimum loss were 0.92 and 0.53, respectively. Near the hub at 90 percent of span, the stator minimum total pressure loss coefficient, inlet Mach number and diffusion factor were 0.15, 1.00 and 0.64, respectively. At 10 percent of span, the stator minimum total pressure loss coefficient, inlet Mach number and diffusion factor were 0.11, 0.86 and 0.52, respectively. At 5 and 95 percent of span, the stator minimum total pressure loss coefficients were 0.21 and 0.25, respectively. At design speed, optimum stator incidence occurred at zero degrees to the suction surface, except near the end walls where minimum losses occurred at positive incidences. Stator deviations at the mid-span were 1 to 2 degrees greater than predicted. Stator deviations at 10 and 90 percent of span were 4 and 7 degrees greater than predicted. Test data are presented to show the variation of deviation, diffusion factor and stator loss coefficient as a function of incidence angle.

The maximum flow obtained at design speed was 135.9 pounds per second, or 0.9 pound per second higher than design flow. Overall stage efficiency at this flow and design speed was one-half point higher than predicted.

II. INTRODUCTION

Under Contract NAS3-7614 to NASA, the Pratt & Whitney Aircraft Division of United Aircraft Corporation investigated blade element performance of stators designed to operate in the transonic range.

The objective of this investigation was to obtain blade element data on a family of multiple-circular-arc (MCA) blade shapes, which are considered suitable for stator blade sections that operate at high flow Mach numbers. This new family of blade shapes is defined as two double-circular-arc blade segments joined at a common transition point, where the forward and rearward portions of the blade are circular-arc sections of different radii. These blade shapes are aimed at controlling the flow turning over the forward portion of the blade with respect to the total turning to minimize losses associated with flow shocks.

The contract included testing three different stator airfoil shapes utilizing an inlet guide vane and flow generation rotor. Two stators have multiple-circular-arc airfoils with the supersonic turning equal to 0.6 of that for an equivalent double-circular-arc airfoil stator. One multiple-circular-arc design (MCA Stator A) has the transition between the low curvature forward section and the rearward section at the assumed passage shock position. The other design (MCA Stator B) has its transition point moved to the rear of the shock location. A third stator with double-circular-arc airfoils provides a basis for comparison.

The three sets of stators were designed for an inlet relative Mach number of 1.1 at the hub and an inlet flow angle of 48 degrees. The blading was designed to turn the flow to the axial direction at all radii. A hub solidity of 1.91 was selected along with an aspect ratio of 2.06, which resulted in 63 blades having a chord of 2.155 inches. Detail design of these stators, along with the design of the inlet guide vane and flow generation rotor, is given in Reference 1.

This report presents blade element performance of the MCA Stator B. Also presented are overall performance data for the combination of inlet guide vane and rotor and for the combined overall performance of the inlet guide vane, rotor, and MCA Stator B.

III. SYMBOLS

The following symbols are used:

A	- area, ft^2
A_{an}	- annulus area, ft^2 (3.76 at the inlet guide vane leading edge)
A_f	- frontal area, ft^2 (5.241 at the inlet guide vane leading edge)
c	- chord length, in
D	- diffusion factor
i_m	- incidence angle, angle between inlet air direction and line tangent to blade mean camber line at leading edge, degrees
i_s	- incidence angle, angle between inlet air direction and line tangent to blade suction surface at leading edge, degrees
M	- Mach number
N	- rotor speed, rpm
P	- total pressure, psfa
p	- static pressure, psfa
r	- radius, ft
S	- blade spacing, in
T	- total temperature, °R
t	- static temperature, °R
t/c	- thickness-to-chord ratio
U	- rotor speed, ft/sec
V	- air velocity, ft/sec

W - weight flow, lbs/sec

β - air angle, angle between air velocity and axial direction, degrees

γ - ratio of specific heats

$\Delta\beta$ - air turning angle, degrees

δ - ratio of inlet total pressure to standard pressure of 2116.22 lbs/ft^2

$\delta°$ - deviation angle, angle between exit air direction and tangent to blade mean camber line at trailing edge, degrees

η - efficiency, %

θ - ratio of inlet total temperature to standard temperature of 518.6°R

ρ - mass density, lbs-sec^2/ft^4

σ - solidity, ratio of chord to spacing

$\bar{\omega}$ - total pressure loss coefficient

ω - angular velocity of rotor, radians/sec

Superscripts:

$'$ - relative to moving blades

$*$ - designates blade geometry

Subscripts:

ad - adiabatic

p - polytropic

r - radial direction

z - axial direction

θ - tangential direction

0 - plenum chamber

1 - instrument plane upstream of inlet guide vane (IGV)

2 - station at IGV leading edge

3 - station at IGV trailing edge

4 - instrument plane upstream of rotor

5 - station at rotor inlet

6 - station at rotor exit

7 - instrument plane upstream of stator

8 - station at stator leading edge

9 - station at stator trailing edge

10 - instrument plane downstream of stator

IV. APPARATUS AND PROCEDURE

A. Compressor Test Facility

The compressor test facility is shown schematically in Figure 1. It is equipped with a gas-turbine-drive engine using a 2.1:1 gearbox to give the optimum speed-range capability.

Air enters through a calibrated nozzle for flow measurements. A 72-foot straight section of 42-inch-diameter pipe runs from the nozzle to a 90-inch-diameter inlet plenum. Wire-mesh screen and an "egg-crate" structure located midway through the plenum provide a uniform pressure profile into the compressor.

The compressor airflow is exhausted into a toroidal collector and then into a 6-foot-diameter discharge stack. A 6-foot-diameter valve in the stack provides back pressure for the test compressor. Two smaller valves, one 24-inch and one 12-inch, in bypass lines provide vernier control of back pressure.

B. Test Compressor

The test compressor, as shown in Figure 2, is a single stage, axial-flow compressor with an inlet guide vane. It has a constant outside diameter of 31.0 inches and a hub/tip ratio at the stator inlet of 0.70. The inlet guide vane has 27 NACA M400 series vanes, the rotor 28 double-circular-arc blades, and the stator 63 vanes. Complete details of the design are given in Reference 1.

1. Inlet Guide Vane and Rotor

The inlet guide vane and rotor were designed to produce the desired stator inlet flow angle and Mach number distribution. Blade element performances for the inlet guide vane and rotor are given in Reference 2.

2. Stator

The multiple-circular-arc stator is composed of sections of two double-circular-arc blades, joined at a common transition point as shown in Figure 3. The two independent double-circular-arc sections allow control of the amount of supersonic turning and permit optimizing shock losses with respect to diffusion losses in order to obtain minimum overall losses. The transition point for the MCA Stator B Airfoil was located behind the assumed shock location by rotating a line from the assumed shock line rearward through an angle, Z, of 12 degrees as shown in Figure 3. The maximum thickness point is coincident with the transition point. Locating the transition point behind the assumed shock reduces the rate of turning immediately behind the shock. Supersonic suction-surface camber was set at 0.6 that of a double-circular-arc stator having the same inlet and outlet conditions. A summary of the stator design values for eight streamlines at which blade element data were obtained is given in Table I. A photograph of the MCA Stator B is shown in Figure 4.

TABLE I

STATOR DESIGN DATA, MCA STATOR B
(Station 8 - Station 9)

	Percent of Stator Leading Edge Span from O.D.							
	5	10	30	50	70	80	90	95
Inlet Dia.	30.54	30.02	28.18	26.35	24.52	23.60	22.69	22.30
Exit Dia.	30.60	30.05	28.38	26.74	25.11	24.32	23.53	24.24
β_8	41.63	41.46	41.57	42.55	44.02	45.04	46.89	48.08
β_9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
M_8	0.85	0.86	0.90	0.94	1.00	1.04	1.06	1.07
σ	1.412	1.437	1.525	1.627	1.740	1.803	1.870	1.896
t/c	0.078	0.076	0.068	0.060	0.052	0.048	0.044	0.042
c	2.155	2.155	2.155	2.155	2.155	2.155	2.155	2.155
i_m	8.1	8.0	8.0	6.9	6.0	5.5	5.0	4.5
$\delta°$	12.4	11.8	10.5	10.0	10.1	10.2	10.8	11.1
$\overline{\omega}$	0.071	0.073	0.080	0.091	0.108	0.117	0.130	0.136
D	0.52	0.52	0.53	0.54	0.55	0.56	0.57	0.58

Stator leading and trailing edge radii are both 0.01 inch across the span. Design incidence to the suction surface is 0°.

C. Instrumentation

Instrumentation was identical with that used for testing of MCA Stator A, which is described in Reference 2, except for:

- Removal of disk traverse probes in front of the inlet guide vane and rotor.
- Addition of a radially traversing circumferential temperature rake at the stator exit.
- Removal of the three high frequency response, total pressure probes located behind the rotor.

The general construction features of the temperature rake, pressure rakes and traverse probes are illustrated in Figure 5. Figure 6 shows the station number designation and location of instrumentation and blade leading and trailing edge planes. Figure 7 shows the circumferential location of instrumentation.

D. Test Procedure

The test procedure was evolved during the testing of MCA Stator A. During the initial testing of that stator, it was found that inserting traverse probes at the stator inlet caused large circumferential distortions, which affected readings of most fixed instrumentation and of other traverse probes in the airstream. As a result, it was necessary to run traverse probes at the stator inlet independent of other instrumentation.

It was also found during shakedown testing that full immersion of a traverse probe at the stator inlet reduced flow approximately 3 percent. In order to avoid stall while taking data, it was necessary to set traverse data points with a margin of 3 percent above stall flow.

Subsequent analysis of data from initial tests showed that, near the stator hub, loss coefficients were still decreasing as stall was approached. In order to define more complete plots of total pressure loss coefficients versus incidence, extra data points were added within 1 percent of stall flow. No stator inlet traverses were made for these points.

The original test plan scheduled tests at 95 percent of design speed to obtain data at inlet Mach number of approximately 1.0 at the stator hub. However, analysis of the data obtained on MCA Stator A showed that stator inlet Mach numbers were lower than design values. Therefore, 120 percent of design speed was substituted for the 95 percent to obtain higher Mach number data.

Stress was surveyed during the testing of MCA Stator A up to 110 percent of design speed and over a range of flows from wide open throttle to near stall. The stress survey was extended in the MCA Stator B test program to 120 percent of design speed. Stress was monitored on open throttle and near stall operating lines between these speeds, and on the 120-percent speed line between open throttle and near stall. Mechanical limitations were not evident during these tests.

Overall performance and blade element performance tests for the MCA Stator B were run at 50, 70, 90, 100, 110, and 120 percent of design speed. Five complete data points and one near stall point were obtained at all speeds except 120 percent. At 120 percent of design speed, the near stall point was not run because there was a possibility that a hard stall with the small tip clearances at this speed might damage the rig. Complete data points included radial traverse measurements before and after the stator of total pressure, static pressure, and air angle, together with wake rake traverses of stator exit total pressure and temperature. Near stall points were run without traversing ahead of the stator.

E. Calculation Procedure

Data were reduced using the procedure described in Reference 2 to calculate axisymmetric flow conditions in the compressor with the following exceptions:

- Stator vector diagram data and performance parameters were calculated at 5, 10, 30, 50, 70, 80, 90 and 95 percent of blade height.
- Stator exit total temperature profiles were measured in the MCA Stator B test and were not correlated from tests of other stators.

Performance parameters are defined as follows:

a. Incidence Angle (based on mean camber line)

$$i_m = \beta_8 - \beta^*_{8m} \qquad \text{(Stator)}$$

b. Deviation

$$\delta^\circ = \beta_9 - \beta_9^* \qquad \text{(Stator)}$$

c. Diffusion Factor

$$D = 1 - \frac{V_9}{V_8} + \frac{r_8 V_{\theta 8} - r_9 V_{\theta 9}}{(r_8 + r_9)\,\sigma\, V_8} \qquad \text{(Stator)}$$

d. Loss Coefficient

$$\bar{\omega} = \frac{P_8 - P_9}{P_8 - p_8} \qquad \text{(Stator)}$$

e. Loss Parameter

$$\frac{\bar{\omega} \cos \beta_9}{2\sigma} \qquad \text{(Stator)}$$

f. Polytropic Efficiency

$$\eta_p = \frac{\frac{\gamma - 1}{\gamma} \ln\left(\frac{p_9}{p_8}\right)}{\ln\left(\frac{t_9}{t_8}\right)} \qquad \text{(Stator)}$$

g. Adiabatic Efficiency

1. $$\eta_{ad} = \frac{\left(\frac{P_6}{P_0}\right)^{\frac{\gamma-1}{\gamma}} - 1}{\left(\frac{T_{10}}{T_0}\right) - 1} \qquad \text{(IGV - Rotor)}$$

2. $$\eta_{ad} = \frac{\left(\frac{P_{10}}{P_0}\right)^{\frac{\gamma-1}{\gamma}} - 1}{\left(\frac{T_{10}}{T_0}\right) - 1} \qquad \text{(IGV- Rotor -Stator)}$$

h. Pressure Coefficients

1. $$C_p = \frac{p_{(local)} - p_8}{1/2\, \rho_8\, V_8^2} \qquad \text{(Stator)}$$

2. $$S \text{ factor} = \frac{P_8 - p_{(local)}}{1/2\, \rho_8\, V_8^2} \qquad \text{(Stator)}$$

Note: Leading edge values of local static pressure for C_p and S factor were set equal to the inlet stagnation pressure; trailing edge values for C_p and S factor were based on calculated static pressure at the stator exit plane.

V. RESULTS AND DISCUSSION

Overall performance of the inlet guide vane, rotor, and stator and the blade element performance of the MCA Stator B are presented. Overall performance is presented in plots of pressure ratio and efficiency versus weight flow, with corrected speed as a parameter. Stator blade element performance, including loss coefficient, diffusion factor, and deviation, are presented as functions of incidence. Curves have been drawn through data generated at common test speeds, with design values shown for comparison. Tabulations of Mach number ranges for each speed line were added for convenience. Static pressure distributions for the stator surface and hub channel versus chord length are plotted. Velocity vectors and blade element performance parameters for the MCA Stator B are tabulated in Appendix A.

Inlet guide vane and rotor performance are presented in Reference 2.

A. Overall Performance

Figure 8 presents overall performance of the inlet guide vane, rotor and stator in terms of pressure ratio and efficiency versus corrected weight flow, $W\sqrt{\theta}/\delta$, and versus corrected specific weight flow, $W\sqrt{\theta}/\delta\ A_{an}$, for six corrected rotor speeds. Figure 9 presents the overall performance of the inlet guide vane and rotor combination for the six corrected speeds. Values of corrected airflow were measured with the inlet nozzle. Stall lines were extrapolated from the characteristic speed lines to the measured stall airflows.

Figure 8 shows that the maximum flow obtained at design speed was 135.9 pounds per second, or 0.9 pound per second higher than design flow. The stage efficiency and pressure ratio at this flow and design equivalent speed were 80.3 percent and 1.439 compared with the predicted values of 79.7 percent and 1.485. Maximum stage efficiency obtained at design speed was 80.8 percent at a pressure ratio of 1.502 and an airflow of 132.9 pounds per second. Maximum pressure ratio obtained at design speed was 1.559 at an airflow of 121.1 pounds per second and stage efficiency of 76.0 percent. The low value of stage efficiency can be partially attributed to the fact that the stator loading is very high compared to the rotor work input and that the high stator losses result in a high ratio of loss to work input, and therefore a low efficiency.

B. Blade Element Performance

Blade element performance of the MCA Stator B for six speeds is presented in Figures 10, 11, and 12. Figures show diffusion factor, deviation and total pressure loss coefficient versus incidence, with one plot for each spanwise location. Data were calculated at axial stations corresponding to the leading and trailing edges of the stator.

In general the loss plots exhibit the following trends:

- An increase in minimum loss with increasing Mach number.
- A narrowing of low loss incidence range as Mach number increases.
- Increased minimum loss incidence with increases in Mach number.

Measured mid-span minimum losses at design speed were lower than predicted for comparable values of Mach number. Near the blade ends losses were higher than predicted. The measured mid-span minimum loss at 120 percent of design speed was 0.089 compared to predicted design speed loss of 0.091. The measured inlet Mach number and diffusion factor at 120 percent of design speed are 1.04 and 0.57, respectively. Design mid-span values of loss coefficient, inlet Mach number and diffusion factor are 0.091, 0.94 and 0.54, respectively. At design speed, measured mid-span values of minimum loss coefficient, inlet Mach number and diffusion factor are 0.056, 0.92 and 0.53, respectively. Near the hub at 90 percent of span, the stator minimum total pressure loss coefficient, inlet Mach number and diffusion factor were 0.15, 1.00 and 0.64, respectively. At 10 percent of span, the stator minimum total pressure loss coefficient, inlet Mach number and diffusion factor were 0.11, 0.86 and 0.52, respectively. At 5 and 95 percent of span, the stator minimum total pressure loss coefficients were 0.21 and 0.25, respectively. Minimum loss values taken from the curves of Figure 12 are compared with design values in Figure 13.

Minimum loss levels and optimum incidence angles were defined by test data points for all blade elements. At mid-span section, minimum loss at design speed occurs at zero degrees to the suction surface. At 5, 10, 80, 90 and 95 percent of span, the minimum loss at design speed occurs at positive incidences of 2 to 4 degrees.

Stator loadings for design speed and design incidences agree with predicted loading at the tip section, but are lower than predicted at mid-span section and higher than predicted at the hub. The measured D factors at zero degrees of incidence at 10, 50 and 90 percent of span are 0.52, 0.53 and 0.62, respectively, compared to predicted loadings of 0.52, 0.54 and 0.57.

Deviations at the mid-span are 1 to 2 degrees greater than predicted. Deviations at 10 and 90 percent from the stator tip are 4 and 7 degrees greater than predicted.

The stator loss parameter, $\frac{\bar{\omega} \cos \beta_9}{2\sigma}$, is presented versus diffusion factor for each of eight radial locations in Figure 14. Curves have been drawn through the points representing minimum loss for each speed. The curves shown for each radial position have been adjusted to reflect trends at other radial locations providing a smooth transition as a function of radius. Therefore, at a given radial location the curves will not necessarily represent a mean of the data points obtained at that radial location. The loss parameter as presented is calculated based on the measured total loss and thus includes any losses associated with flow shocks. As speed is increased the D factor at which minimum loss occurs increases due to compressibility. The curves drawn through the minimum loss points indicate an increase in the loss parameter with increasing D factor as might be expected. However, the magnitude of the increase in loss parameter with increase in D factor may, in part, be due to an increase in shock losses associated with the higher Mach number.

Figure 15 presents a comparison of the minimum loss parameter versus D factor for the eight radial locations. The curves indicate an increase in loss parameter in the end wall regions.

Chordwise distributions of the ratio of local static pressure on the hub to stator inlet pressure at 90 percent of span are shown in Figure 16. This figure represents wide open throttle, part throttle and near stall for 50, 100 and 110 percent of operating speed. Static pressures were measured along the hub, midway between two stator vanes. Pressure discontinuities at the open throttle operating points at design speed and 110 percent of design speed indicate shocks in the channel.

Chordwise distributions of pressure coefficient, C_p, on the stator surfaces are shown in Figures 17 through 24. Pressure coefficient, S factors, are shown in Figures 25 through 32. The data are presented for wide open throttle, part throttle, and near stall for 50, 100, and 110 percent of design speed. The pressure distribution which corresponds to near minimum loss is indicated in the figure subtitles. A rapid rise in C_p (rapid decrease in S factor) on the blade suction surface indicates a sharp rise in static pressure due to the presence of a passage shock. The presence of these passage shocks are more apparent at the higher speeds where the flow Mach number is higher. Data for all speeds and throttle settings are tabulated in Appendix B.

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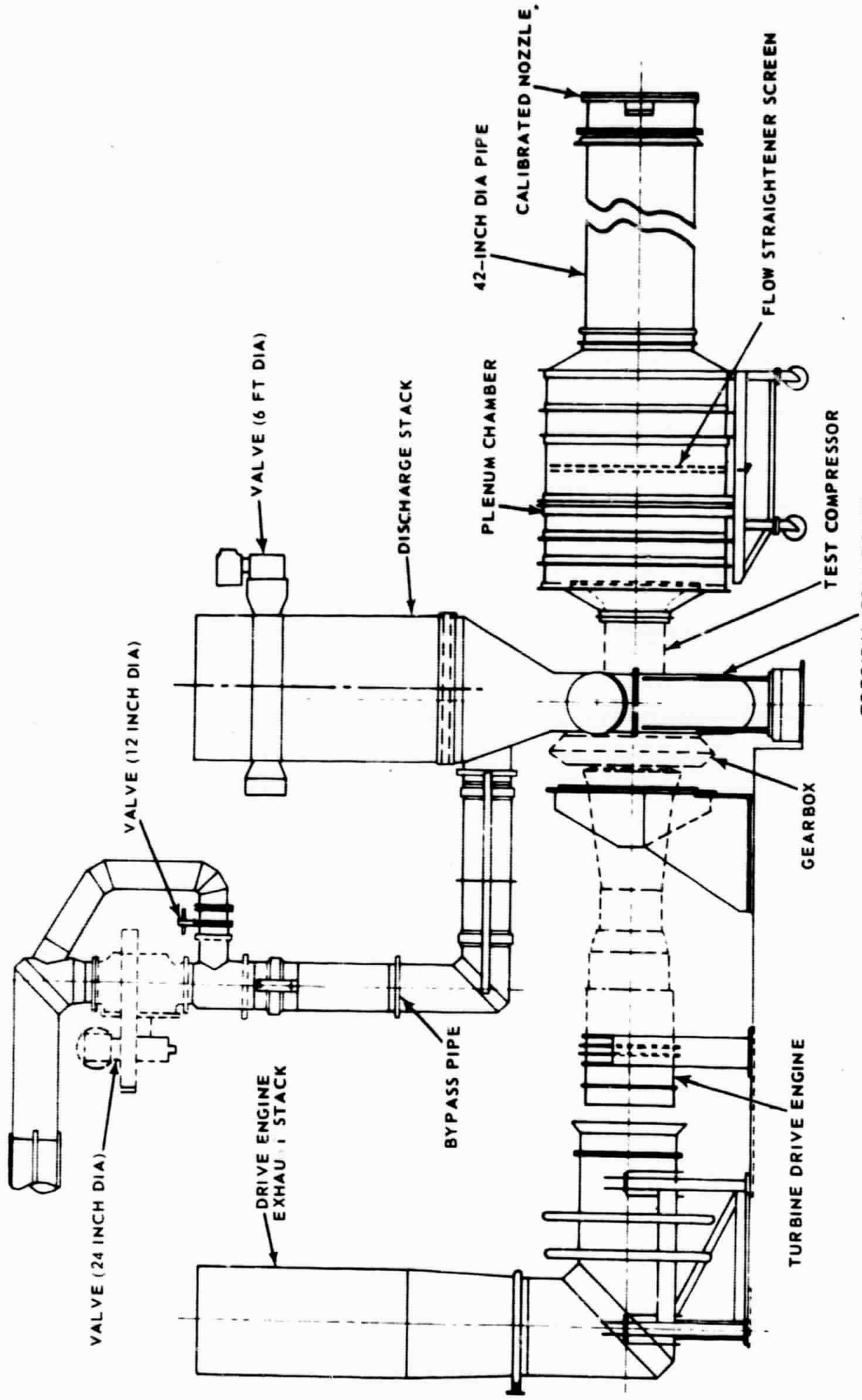


Figure 1 Schematic of Compressor Test Facility

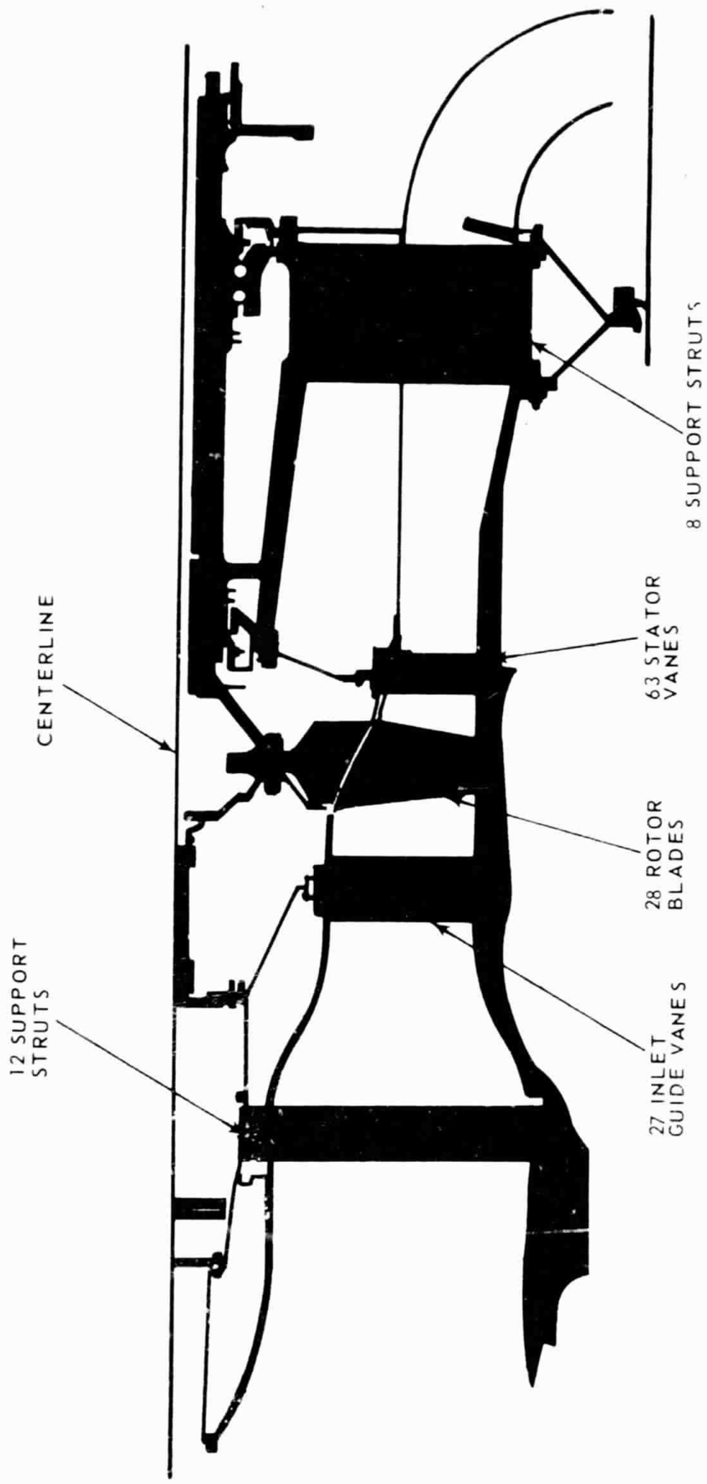


Figure 2 Cross Section of Test Compressor

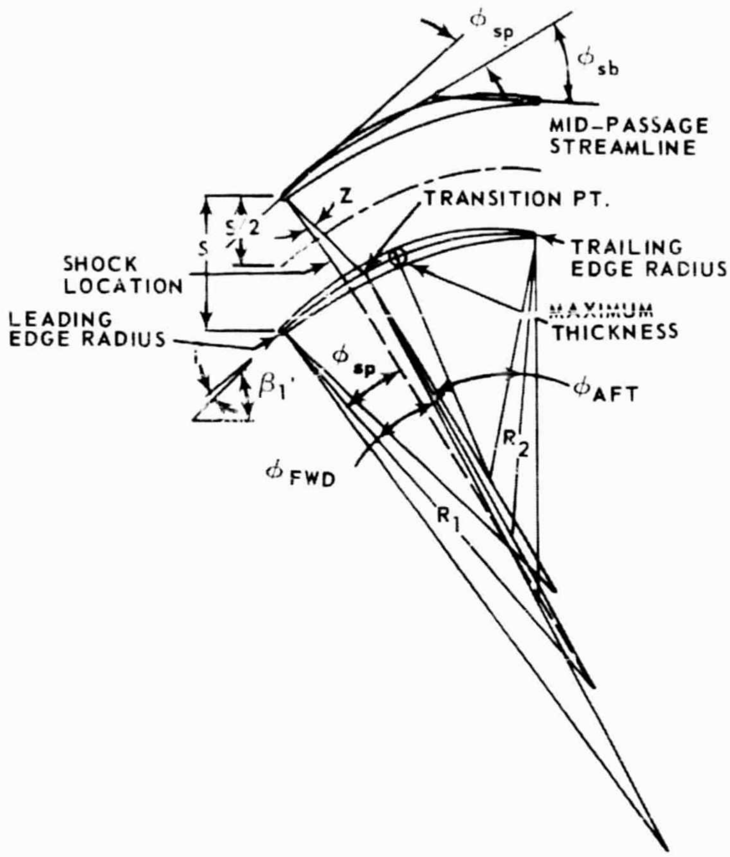


Figure 3 Multiple-Circular-Arc Blade Geometry

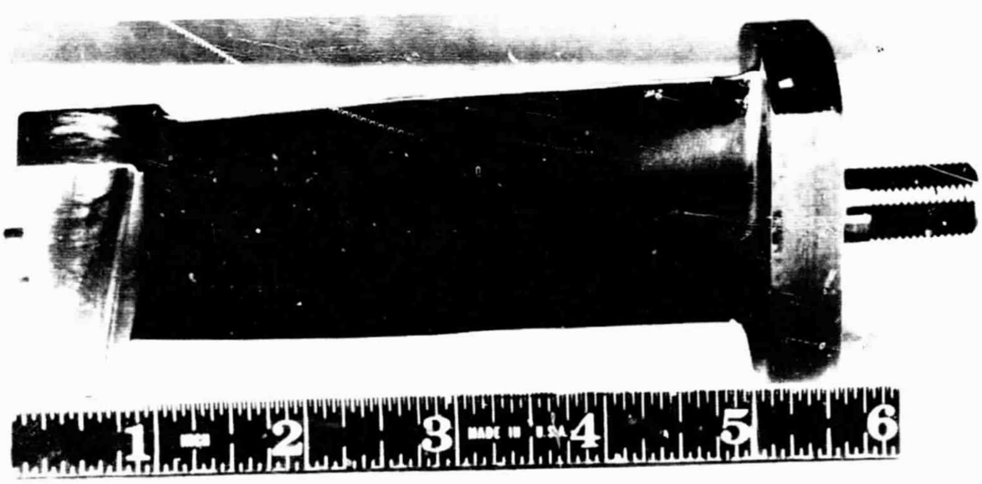
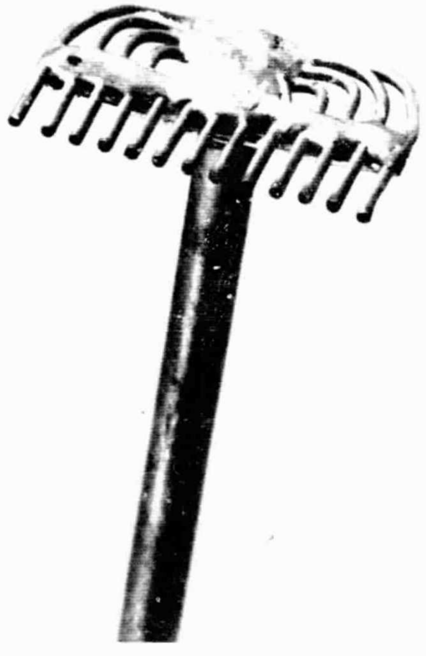
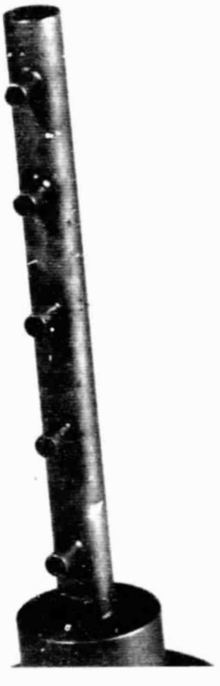


Figure 4 Multiple-Circular-Arc Stator B



Pressure Wake Rake

Circumferential Temperature Rake



Radial Temperature Rake

Disk Probe

Figure 5 Compressor Instrumentation

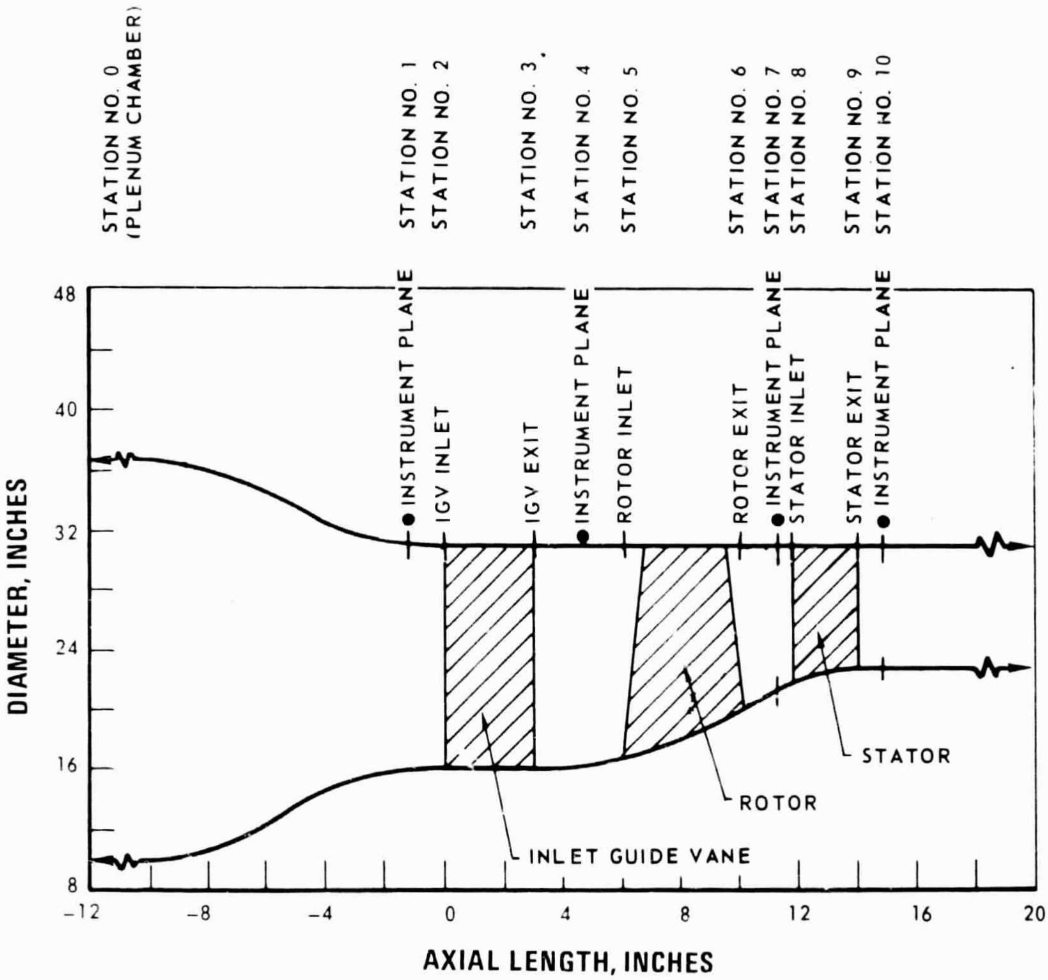


Figure 6 Station Number Designation and Location of Instrumentation and Blade Leading and Trailing Edge Planes

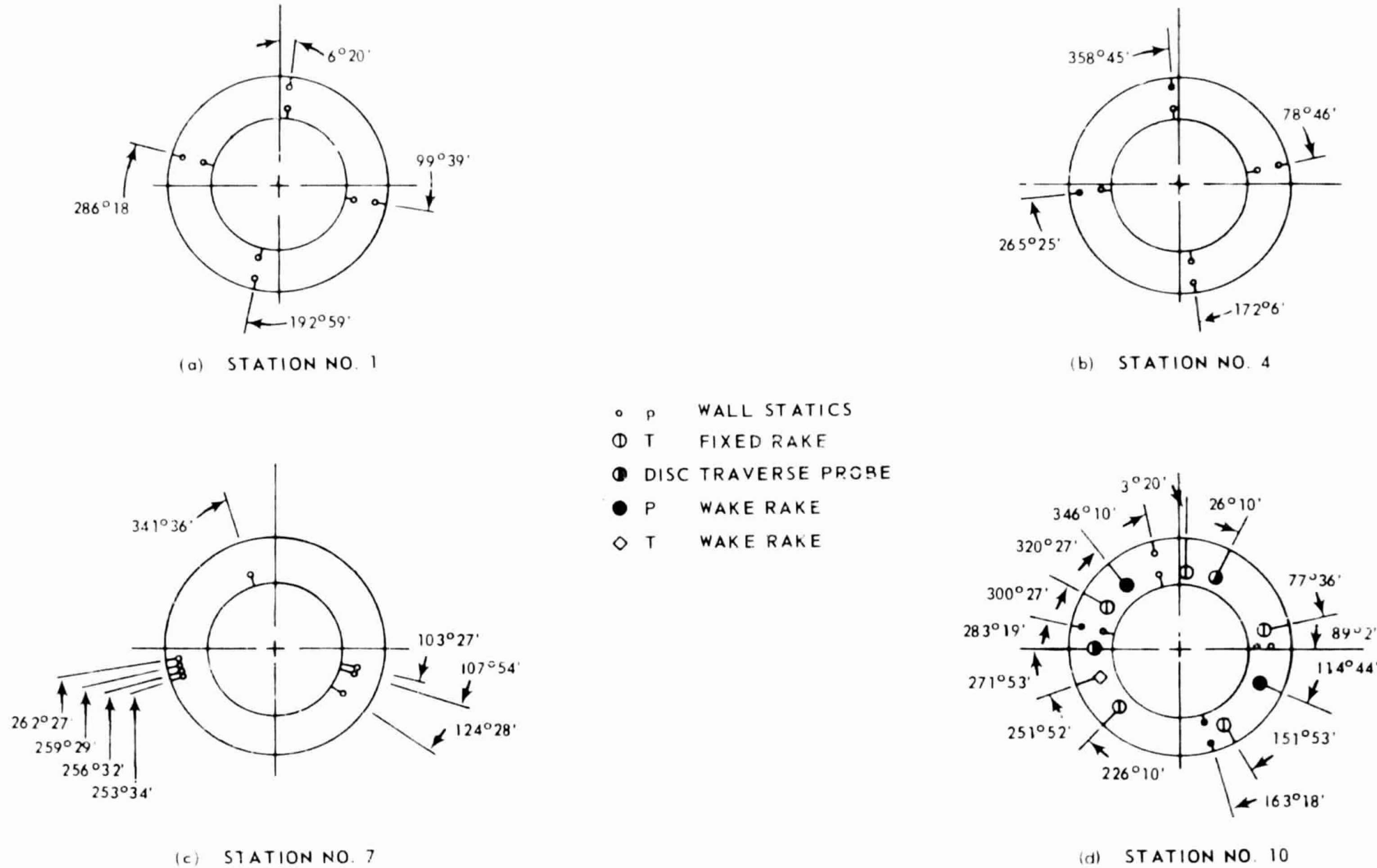


Figure 7 Circumferential Position of Instrumentation

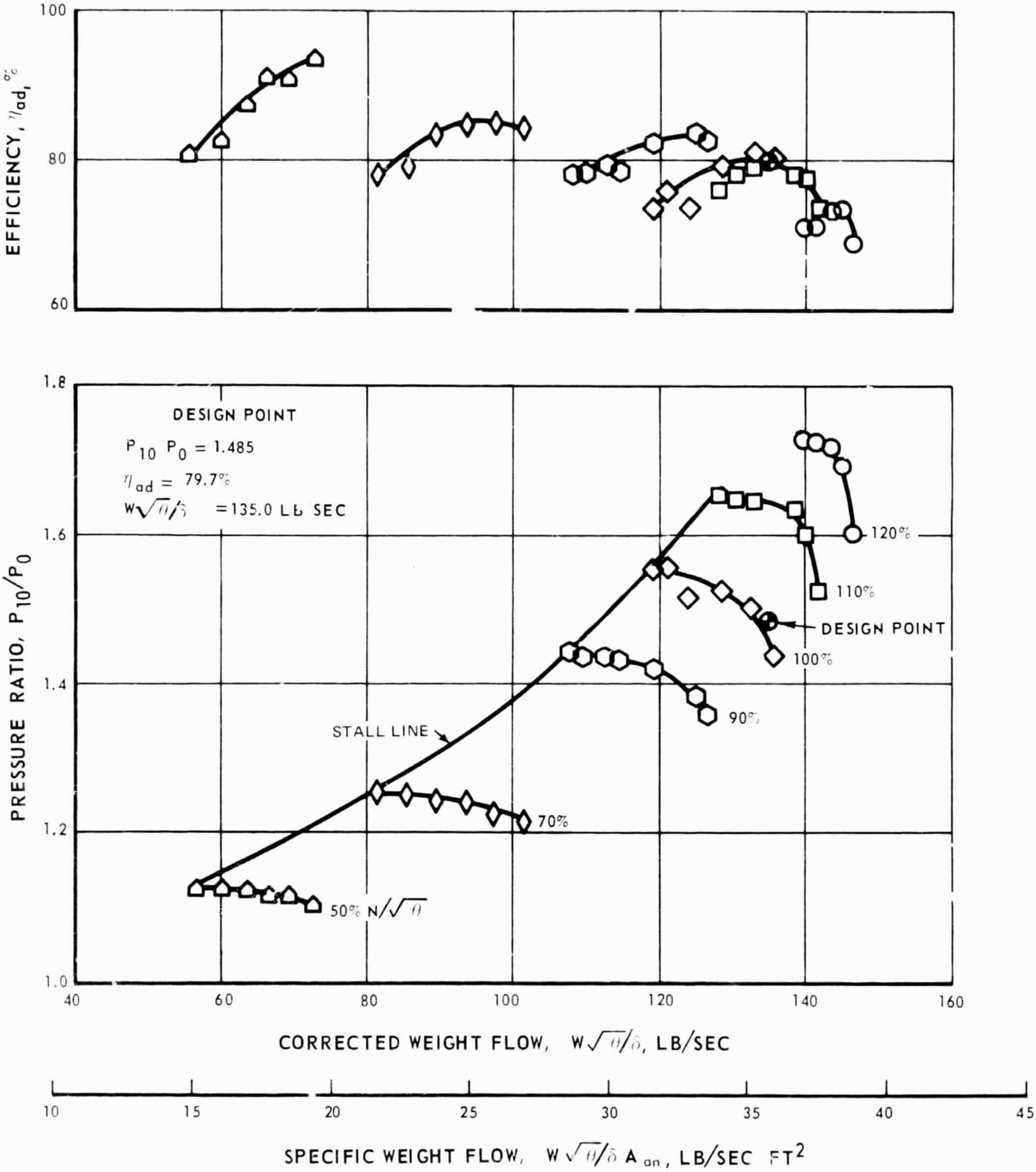


Figure 8 Overall Performance of Inlet Guide Vane, Rotor, and MCA Stator B

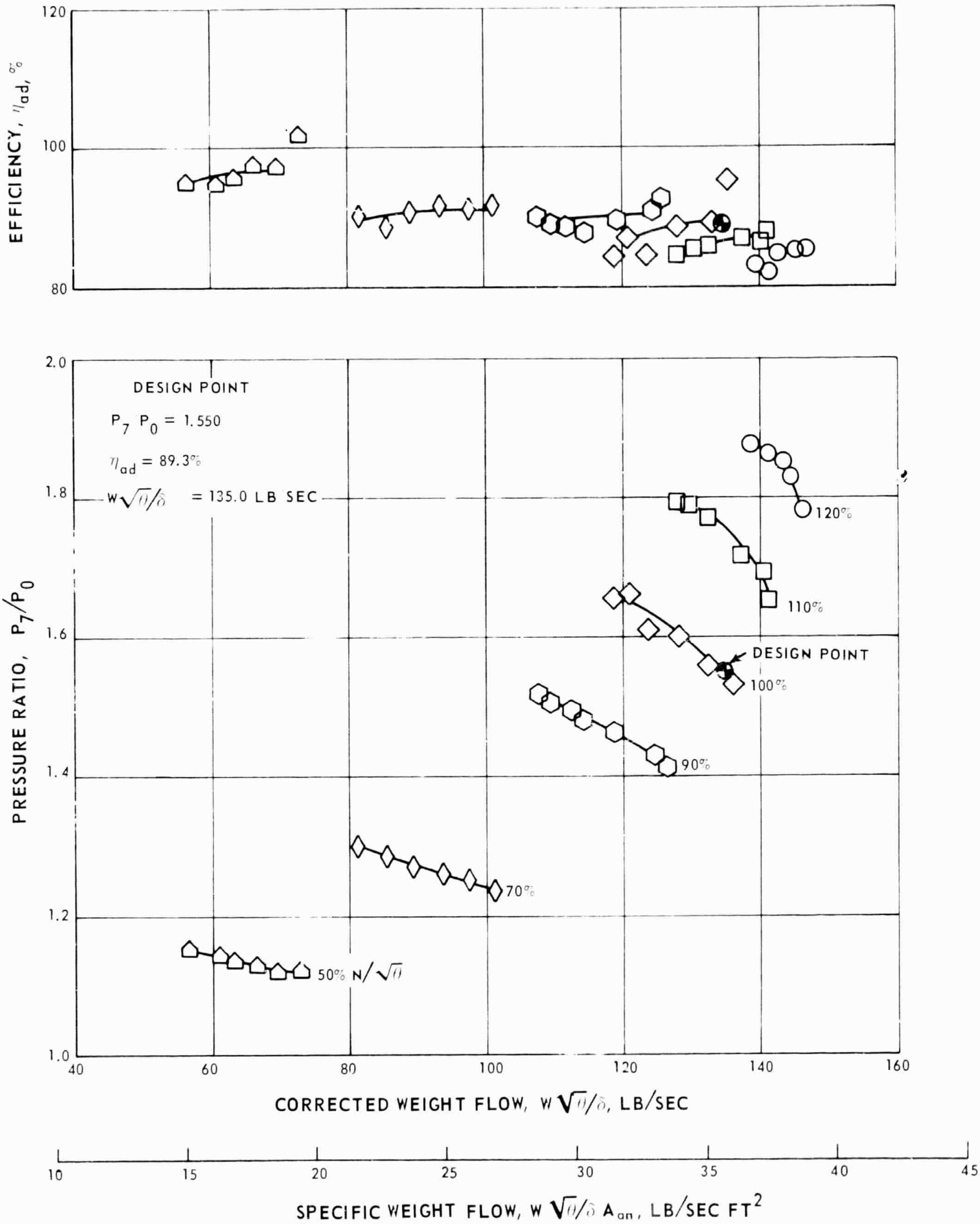
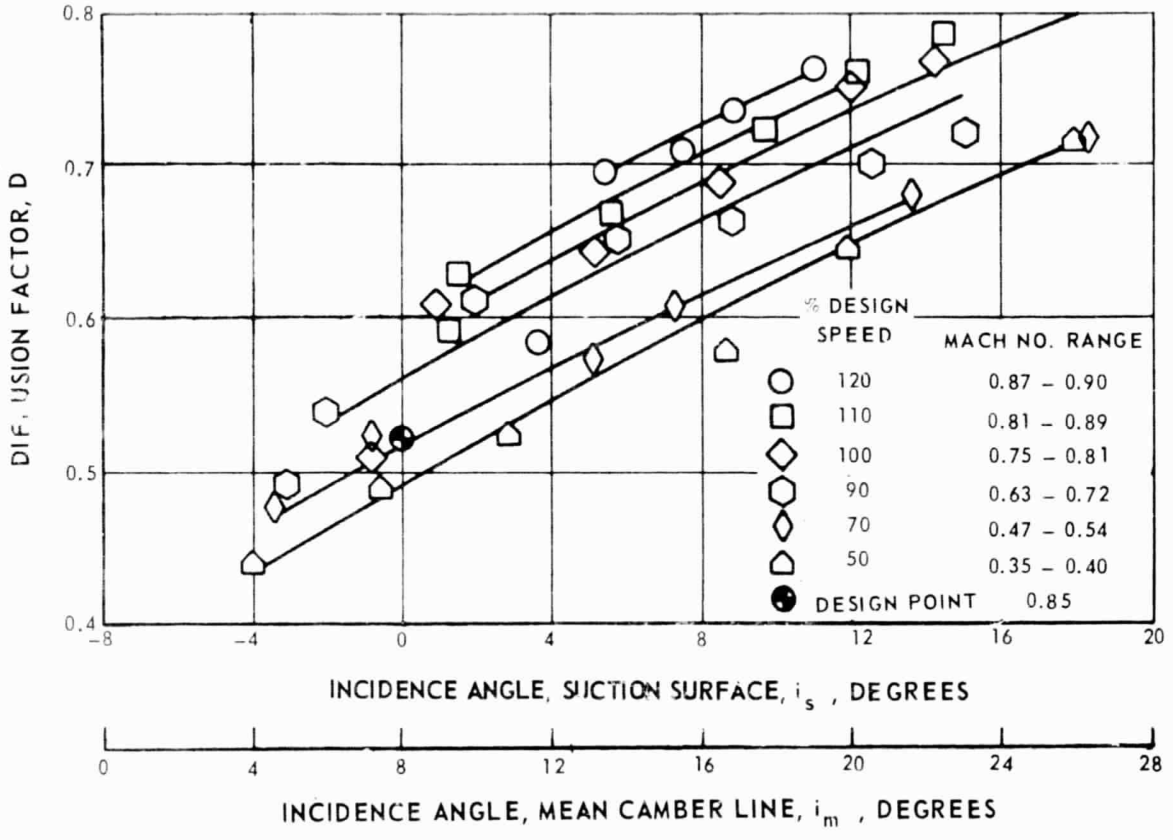
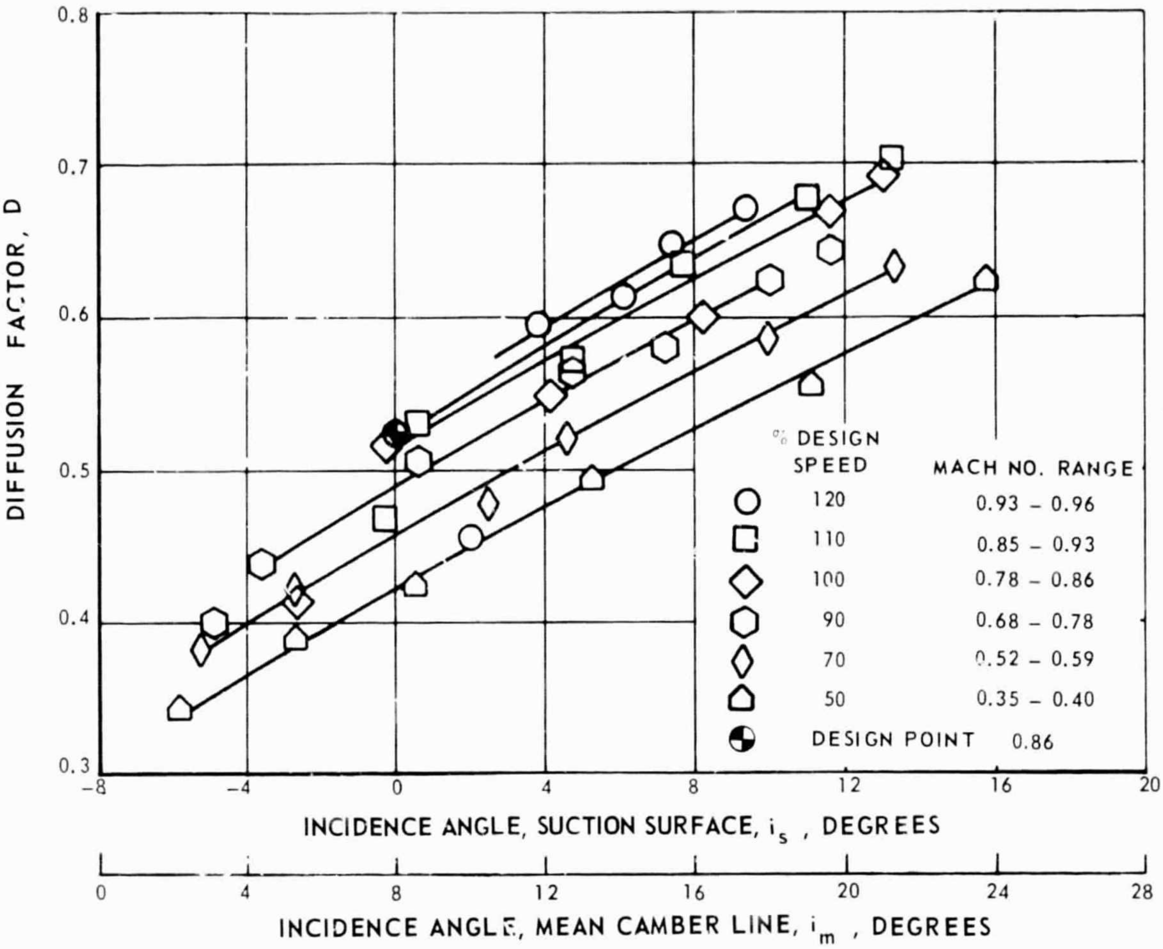


Figure 9 Overall Performance of Inlet Guide Vane and Rotor



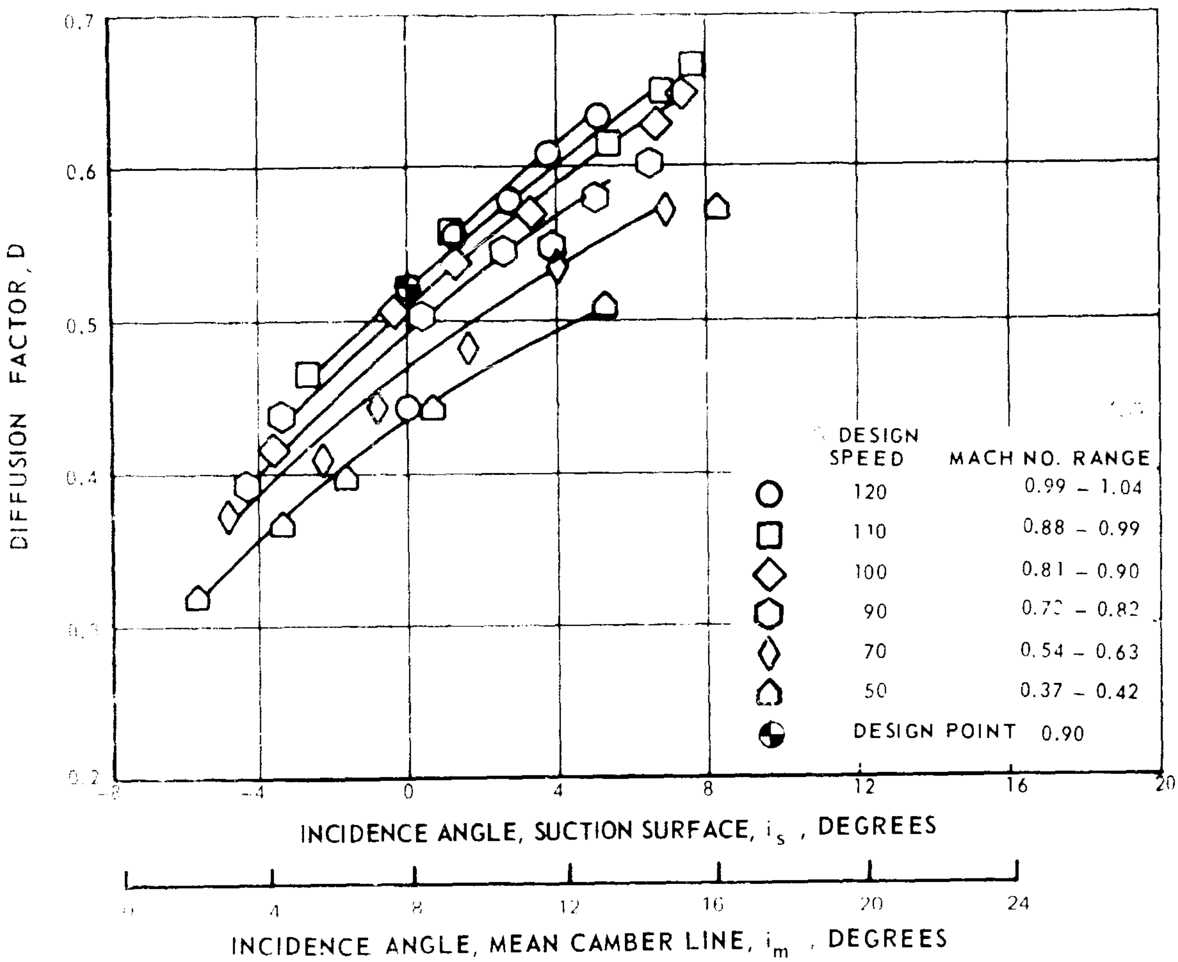
(a) 5% SPAN

Figure 10 MCA Stator B, Diffusion Factor vs. Incidence



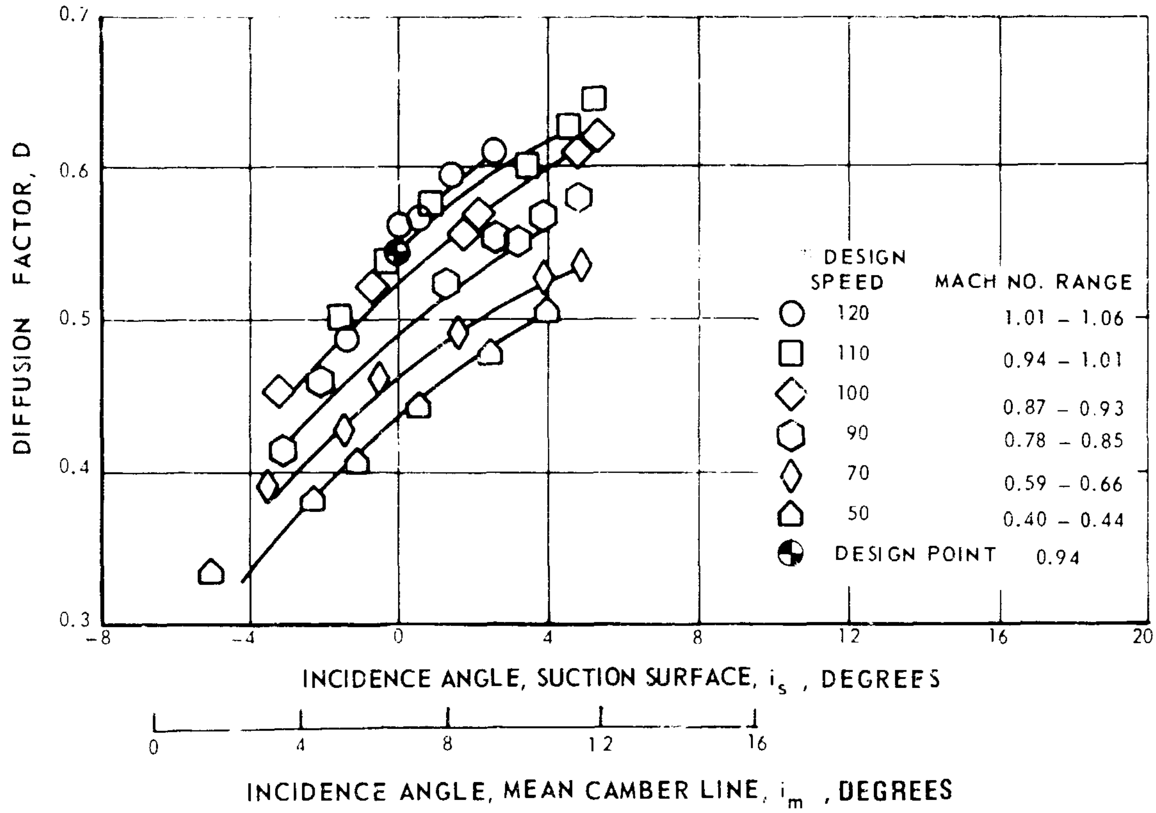
(b) 10% SPAN

Figure 10 MCA Stator B, Diffusion Factor vs. Incidence



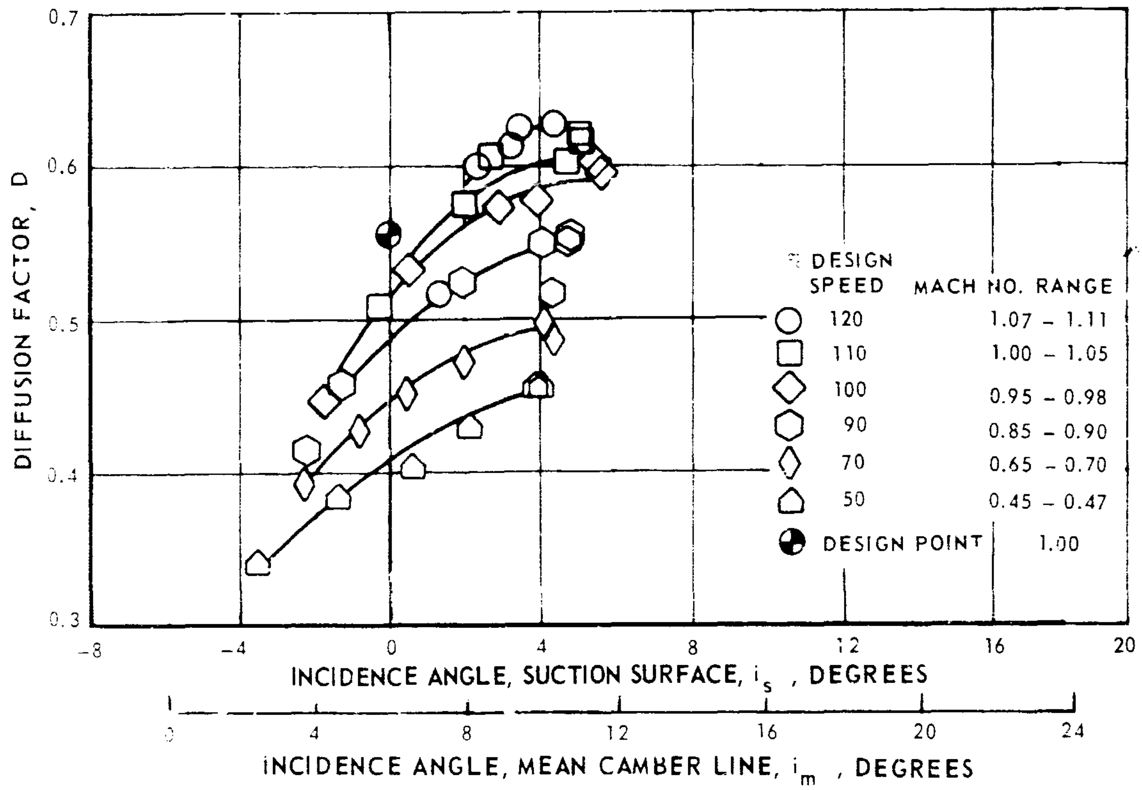
(c) 30% SPAN

Figure 10 MCA Stator B, Diffusion Factor vs. Incidence



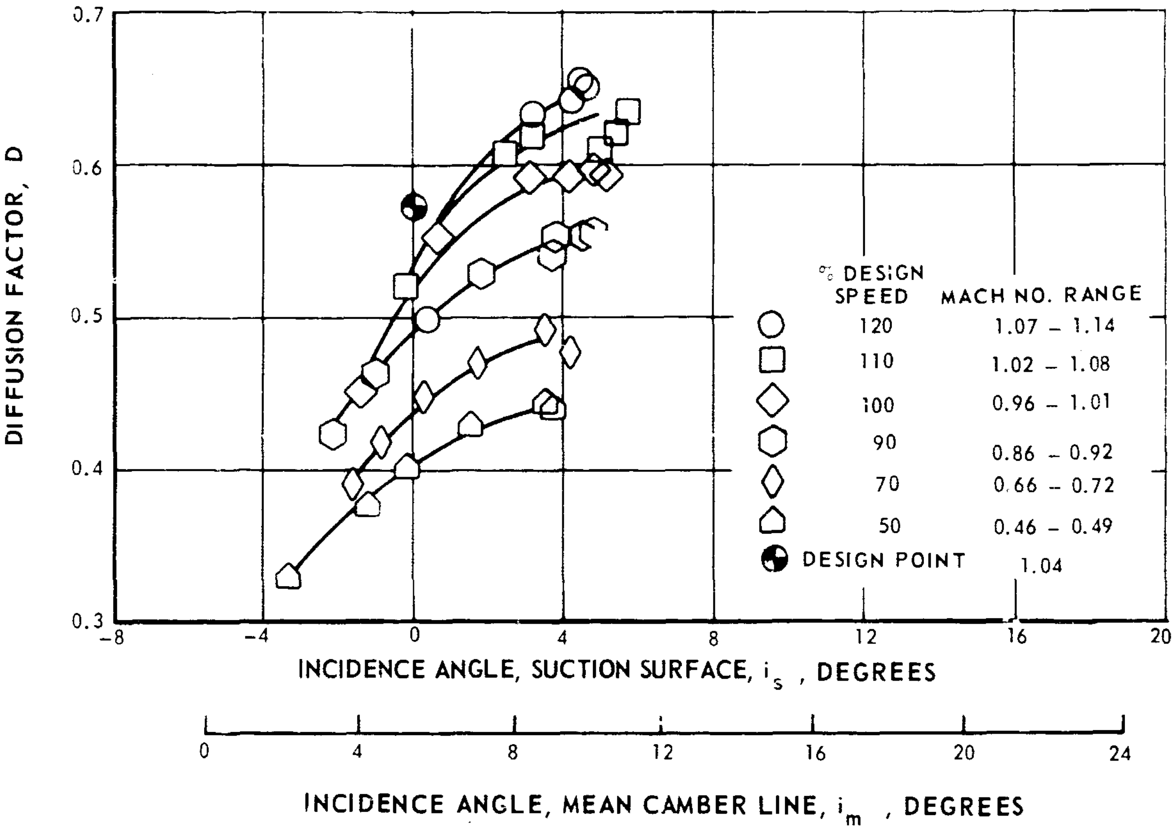
(d) 50% SPAN

Figure 10 MCA Stator B, Diffusion Factor vs. Incidence



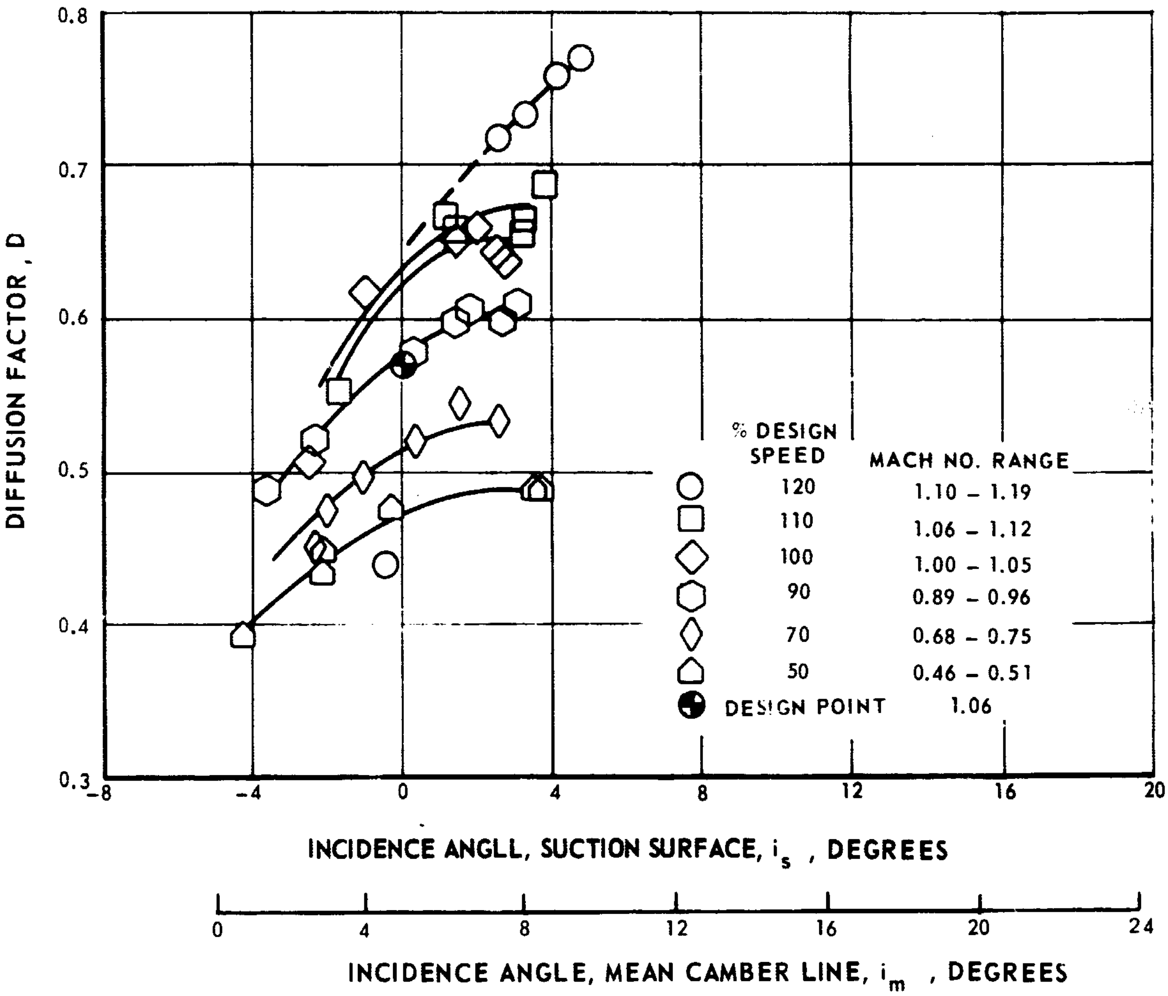
(e) 70% SPAN

Figure 10 MCA Stator B, Diffusion Factor vs. Incidence



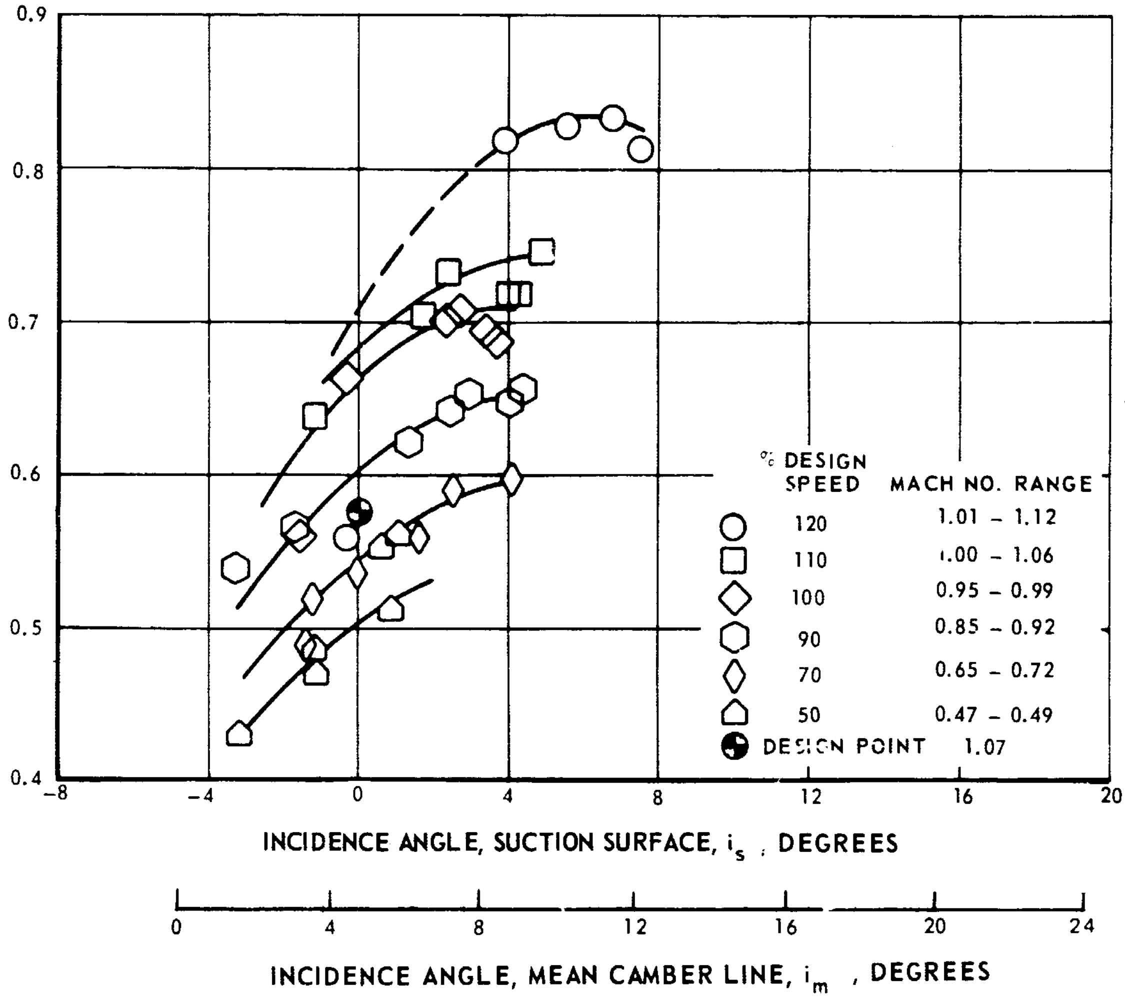
(f) 80% SPAN

Figure 10 MCA Stator B, Diffusion Factor vs. Incidence



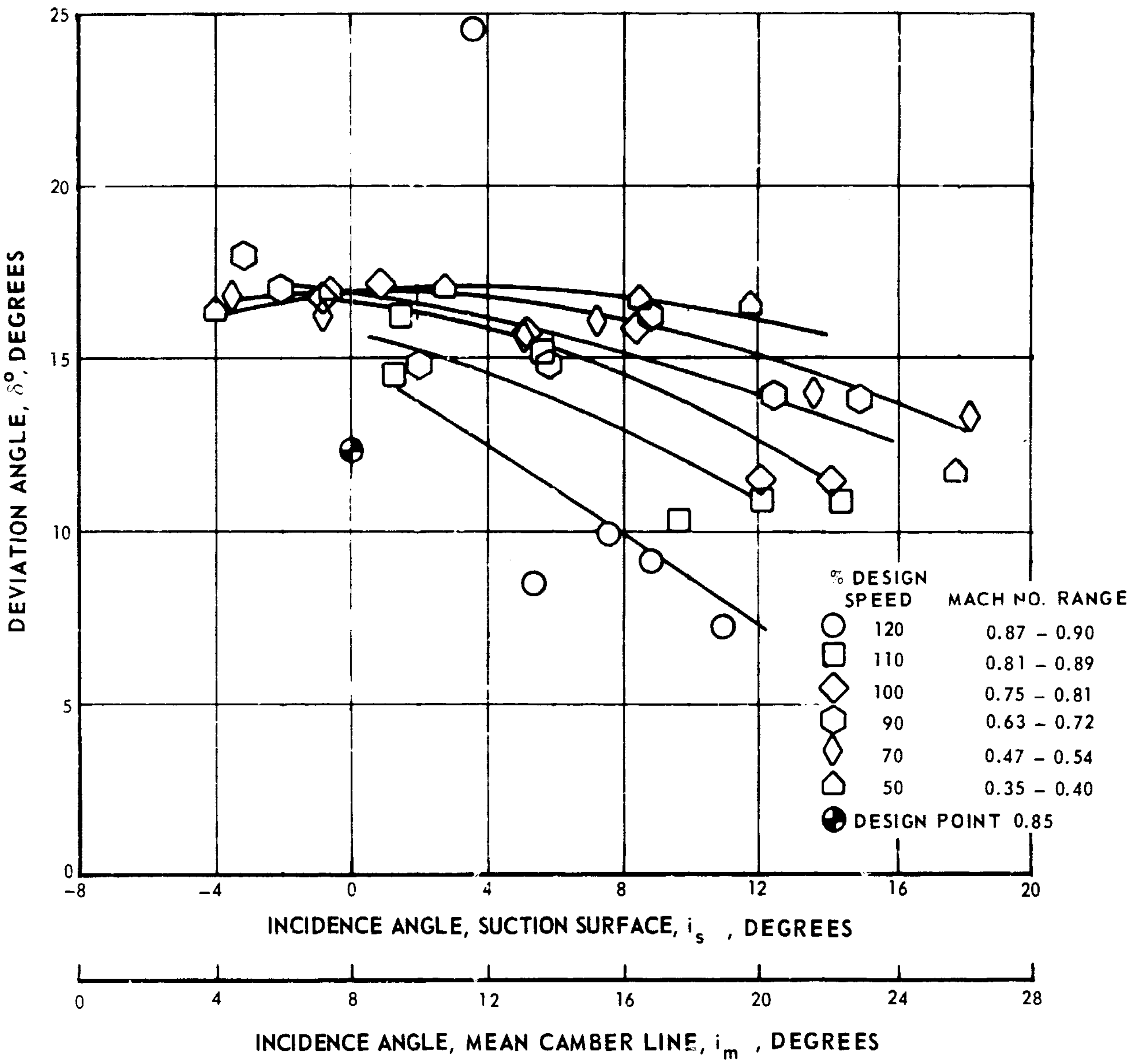
(g) 90% SPAN

Figure 10 MCA Stator B, Diffusion Factor vs. Incidence



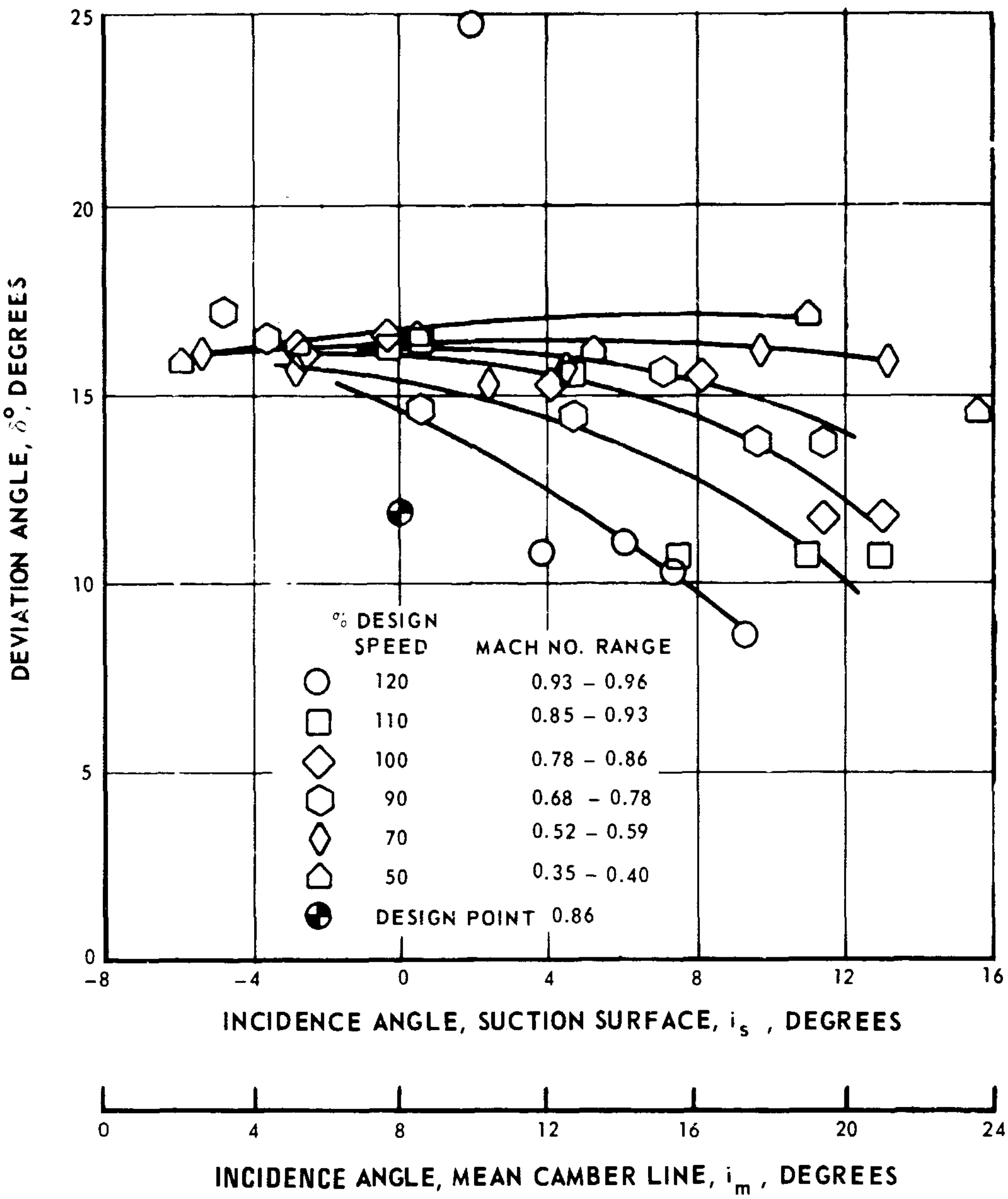
(h) 95% SPAN

Figure 10 MCA Stator B, Diffusion Factor vs. Incidence



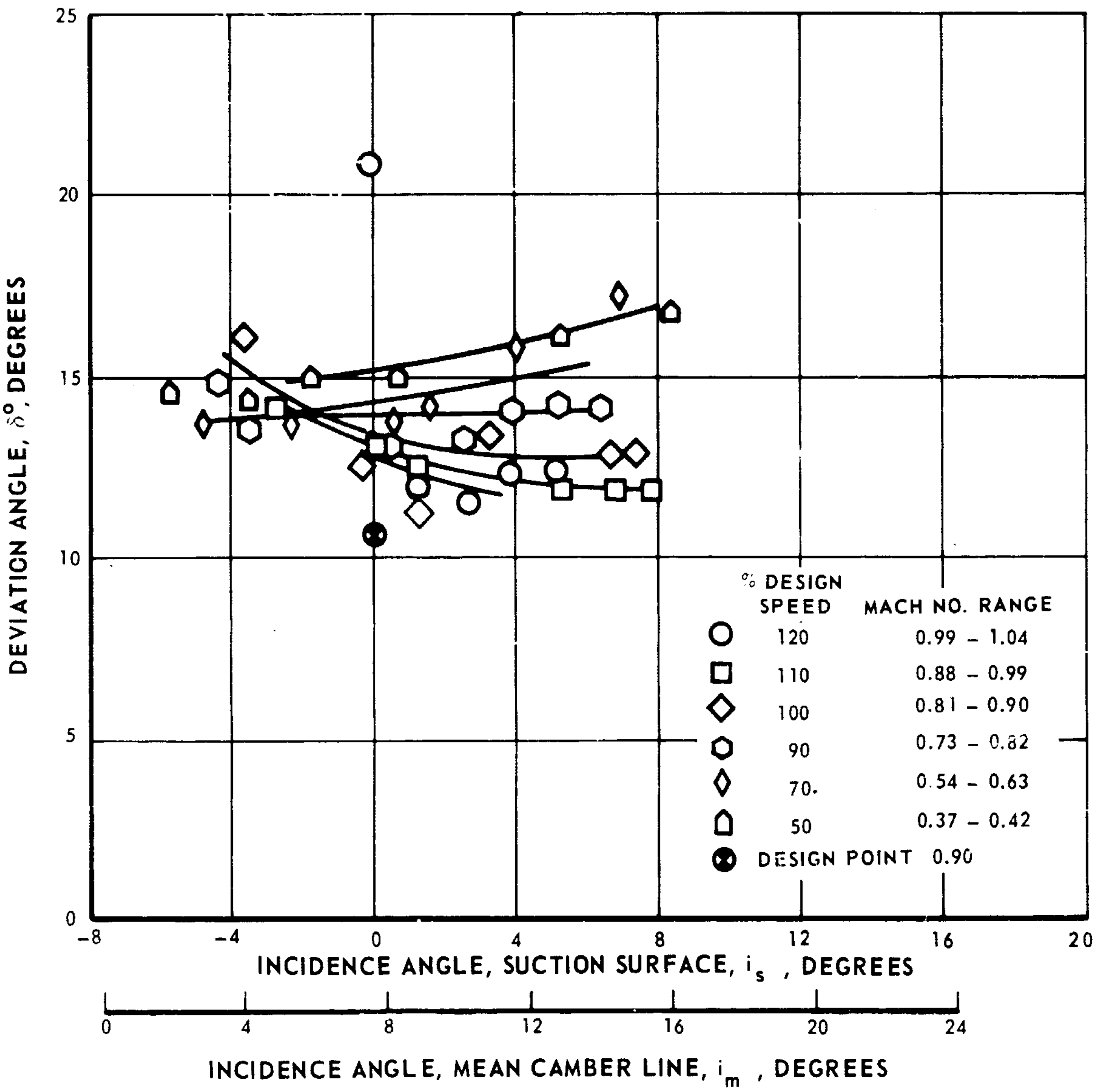
(a) 5% SPAN

Figure 1i MCA Stator B, Deviation vs. Incidence



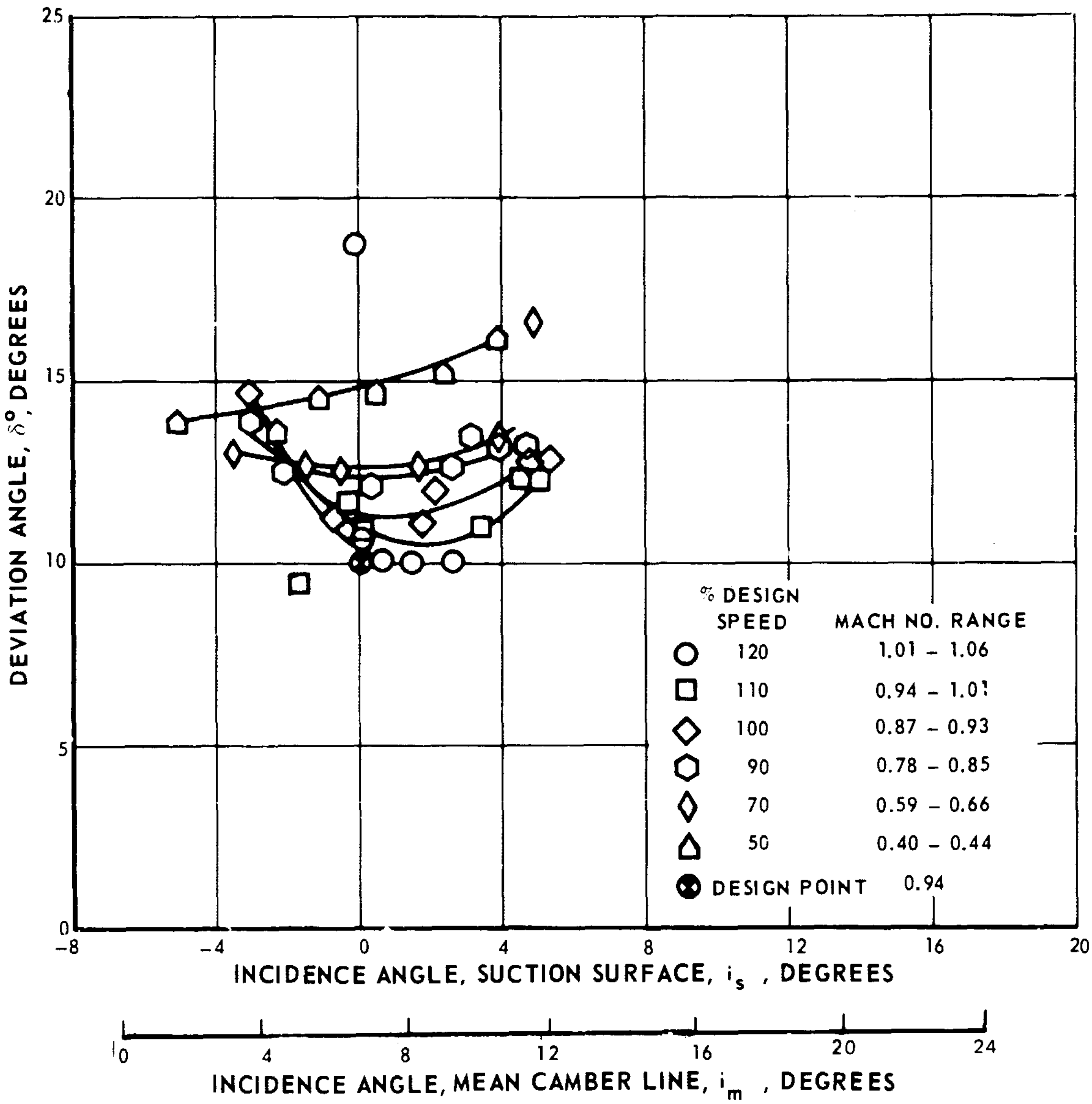
(b) 10% SPAN

Figure 11 MCA Stator B, Deviation vs. Incidence



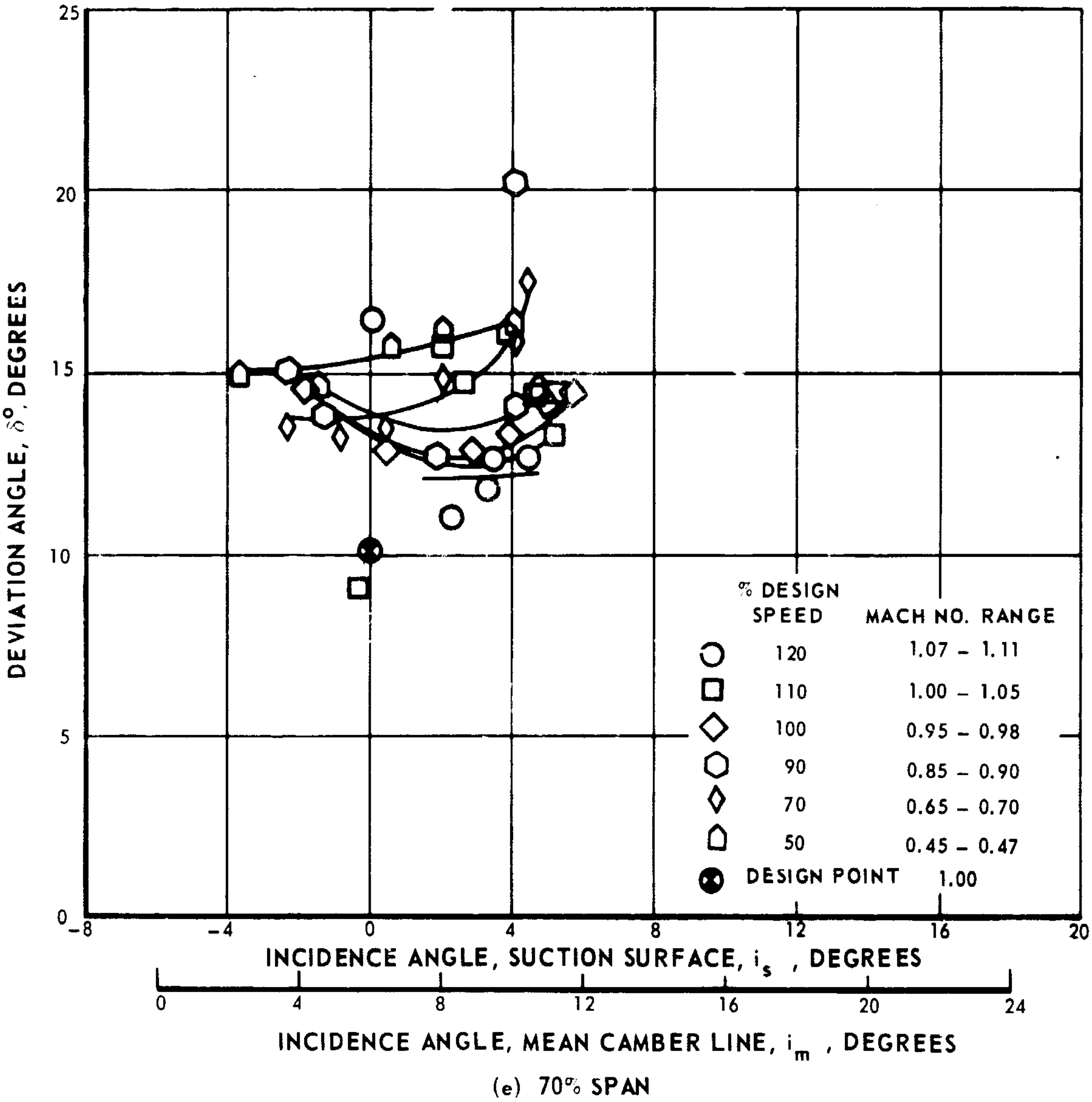
(c) 30% SPAN

Figure 11 MCA Stator B, Deviation vs. Incidence



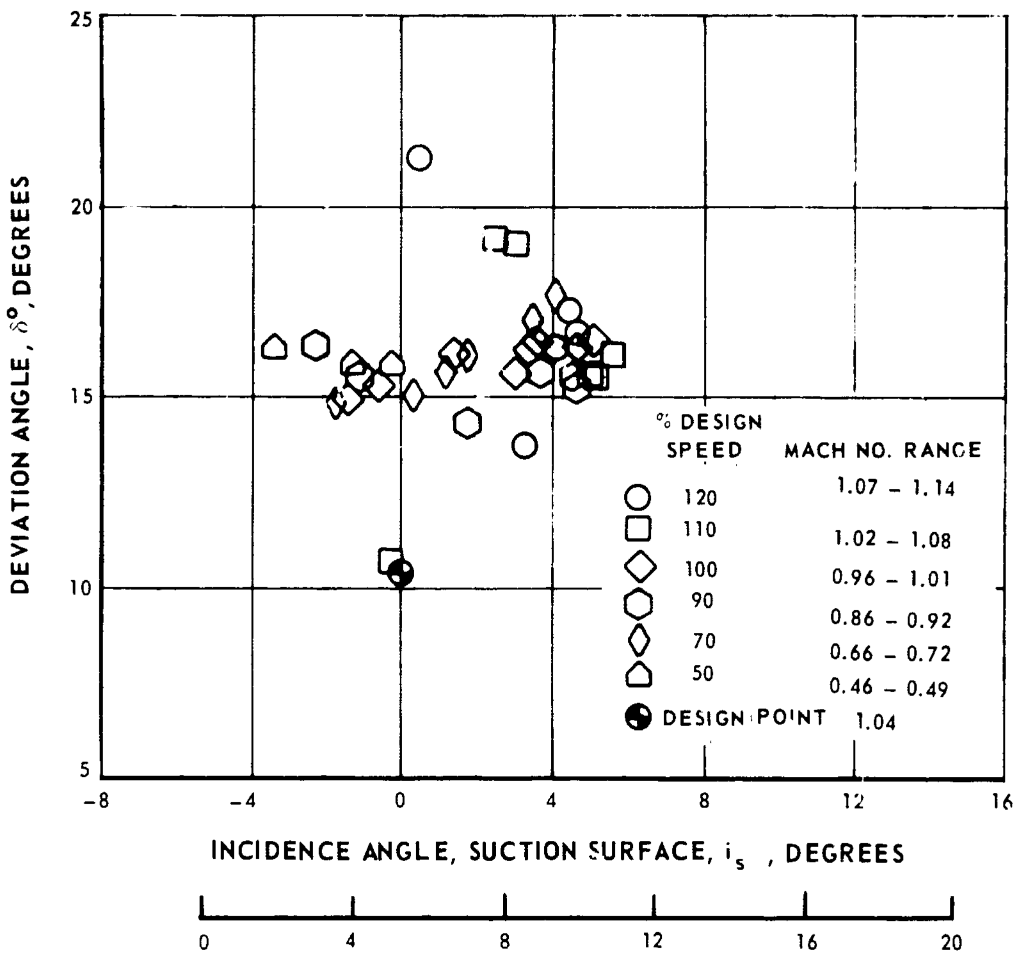
(d) 50% SPAN

Figure 11 MCA Stator B, Deviation vs. Incidence



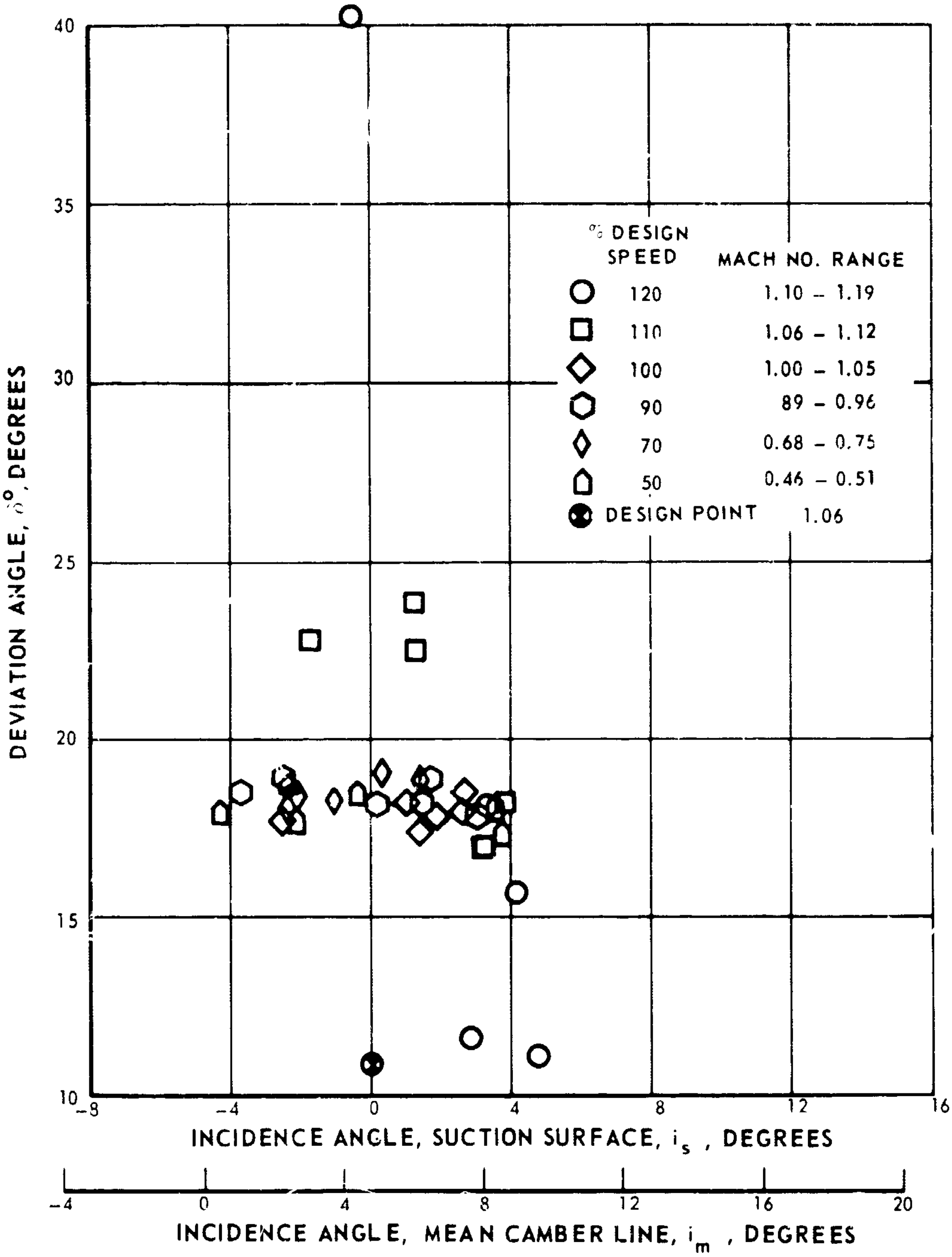
(e) 70% SPAN

Figure 11 MCA Stator B, Deviation vs. Incidence



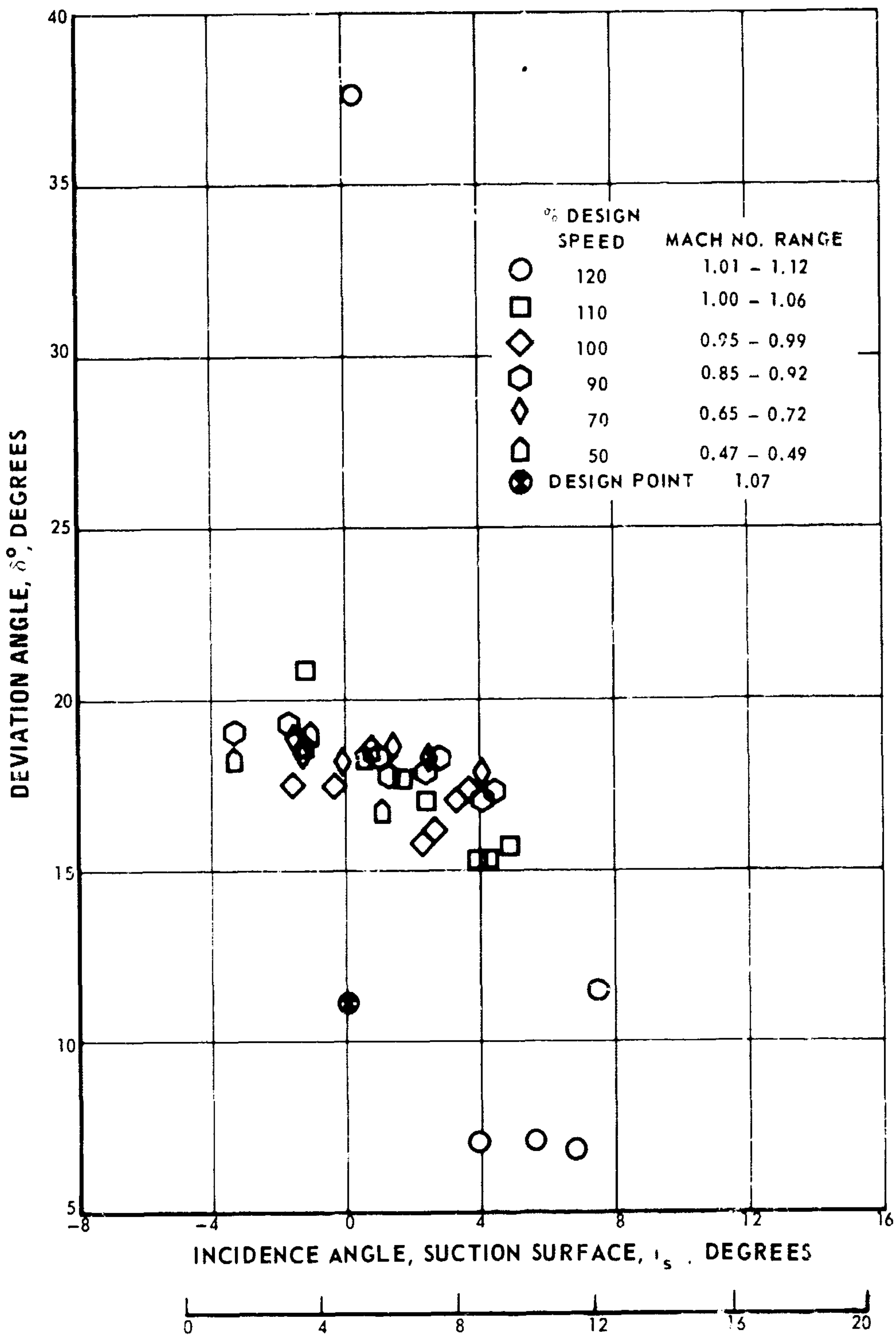
(f) 80% SPAN

Figure 11 MCA Stator B, Deviation vs. Incidence



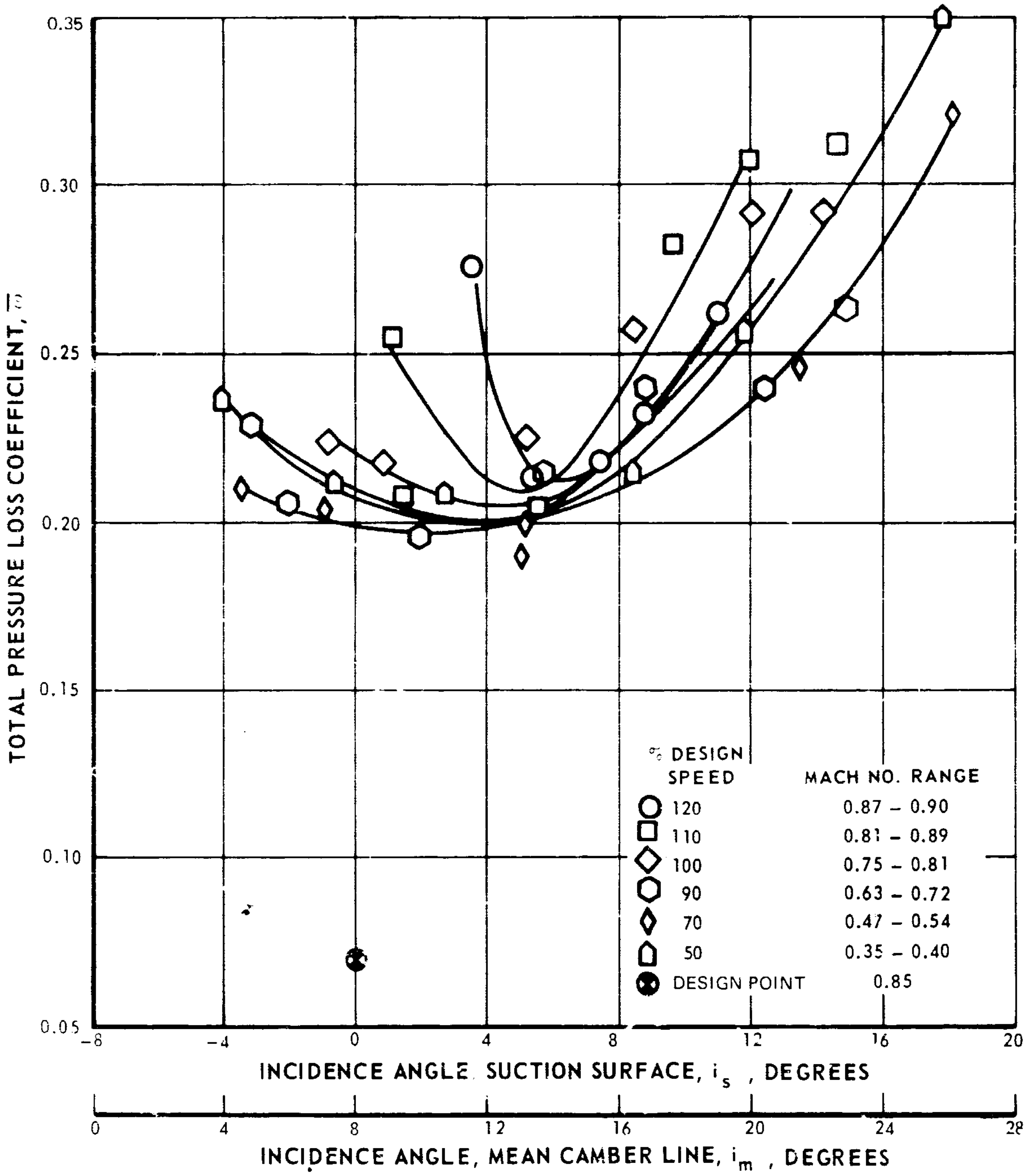
(g) 90% SPAN

Figure 11 MCA Stator B, Deviation vs. Incidence



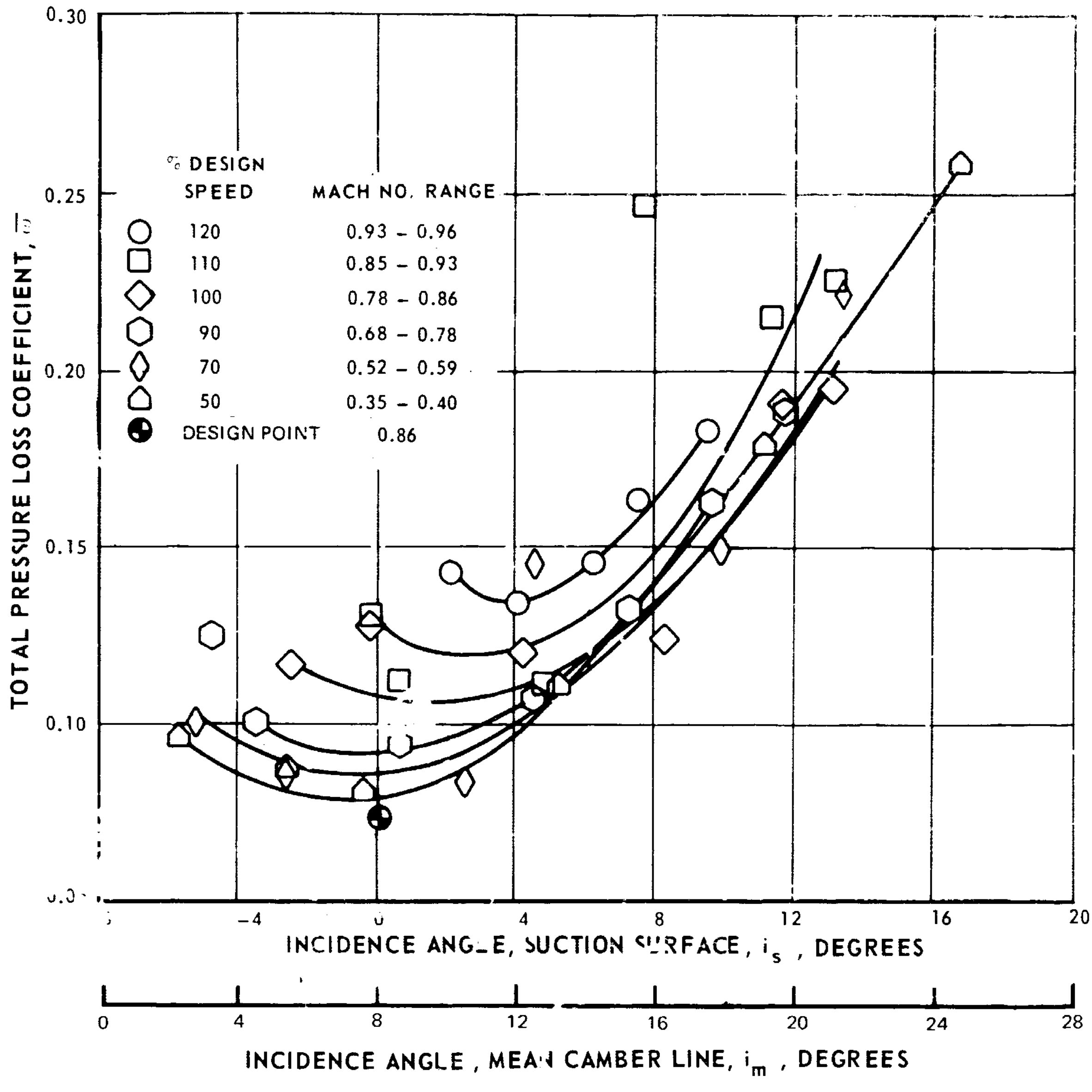
(h) 95% SPAN

Figure 11 MCA Stator B, Deviation vs. Incidence



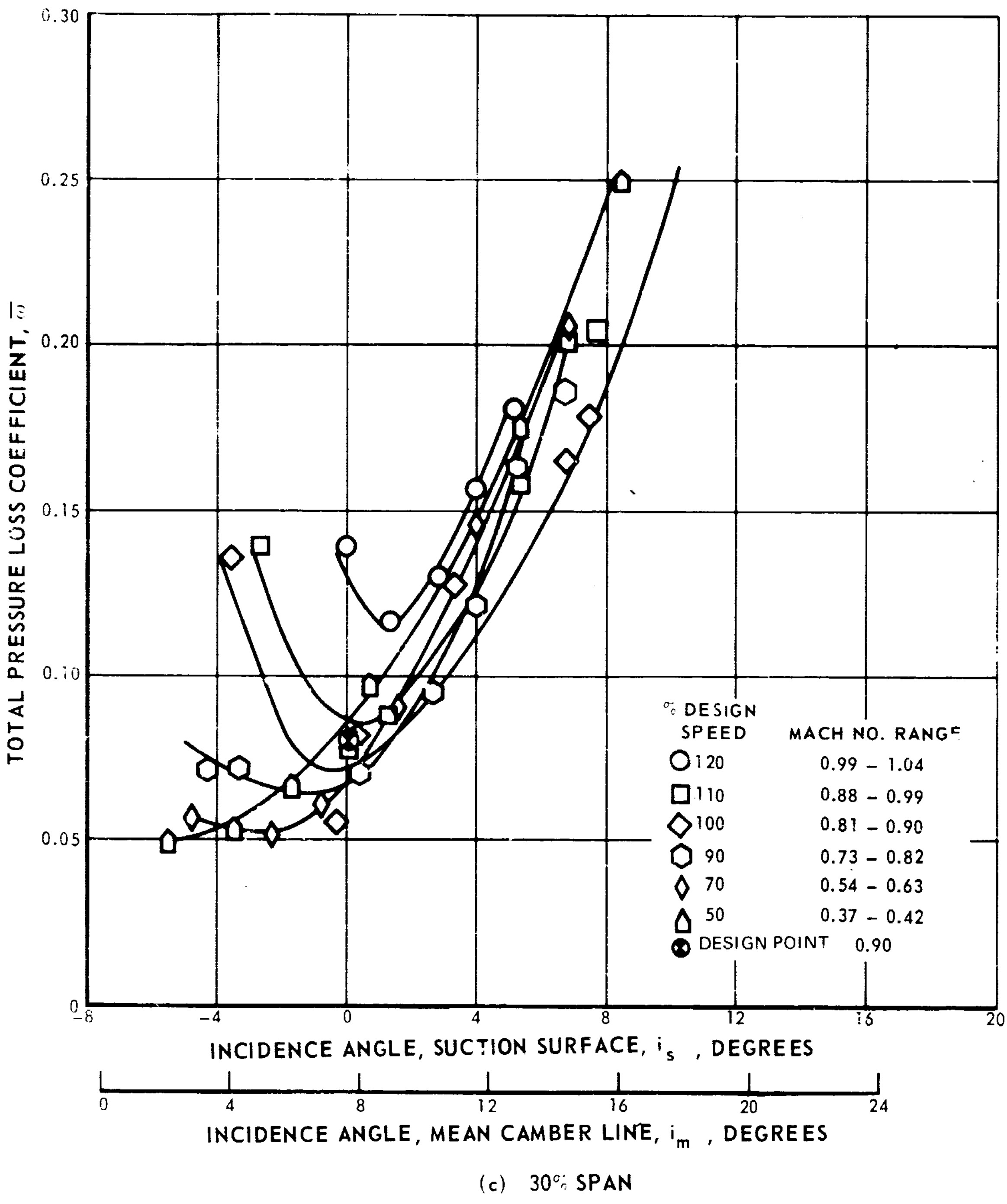
(a) 5% SPAN

Figure 12 MCA Stator B, Total Pressure Loss Coefficient vs. Incidence



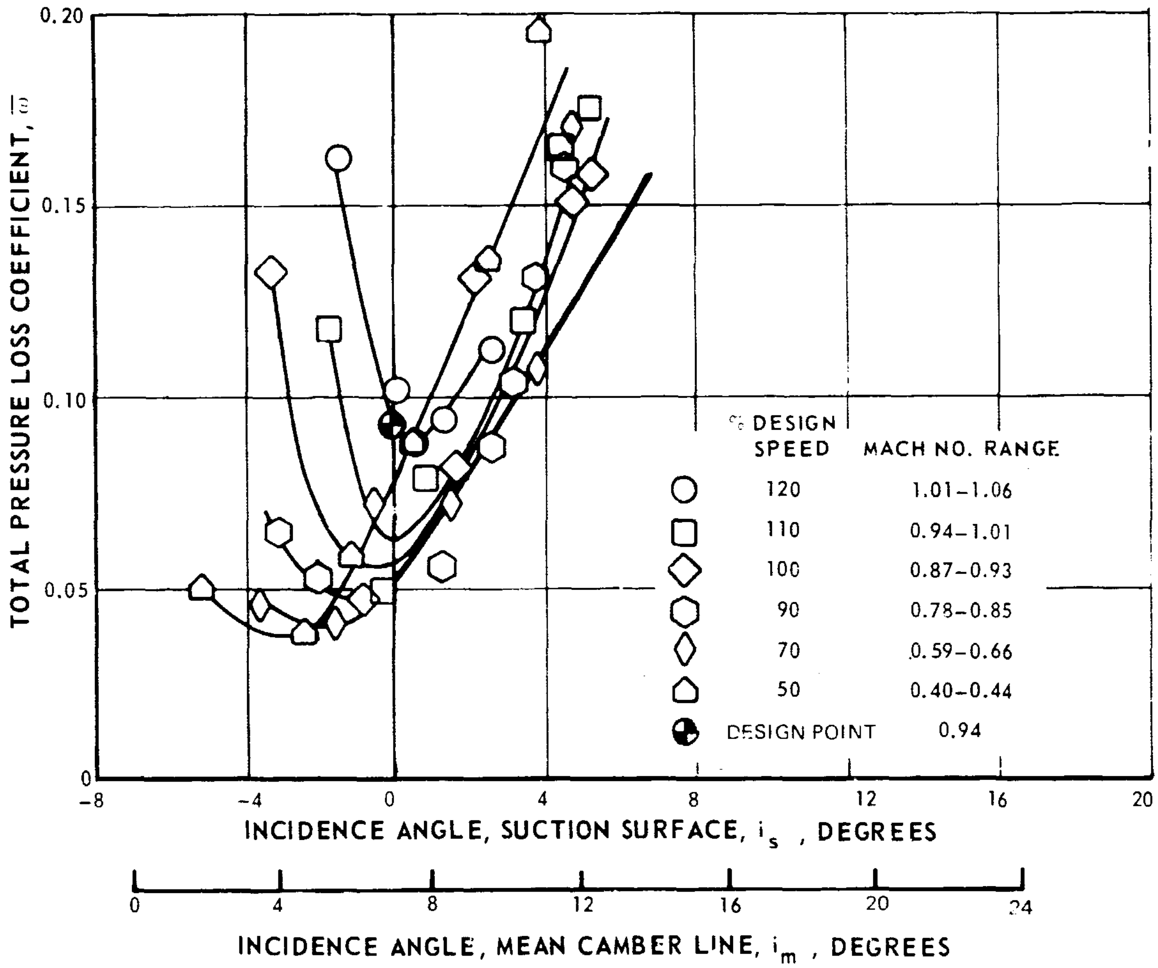
(b) 10% SPAN

Figure 12 MCA Stator B, Total Pressure Loss Coefficient vs. Incidence



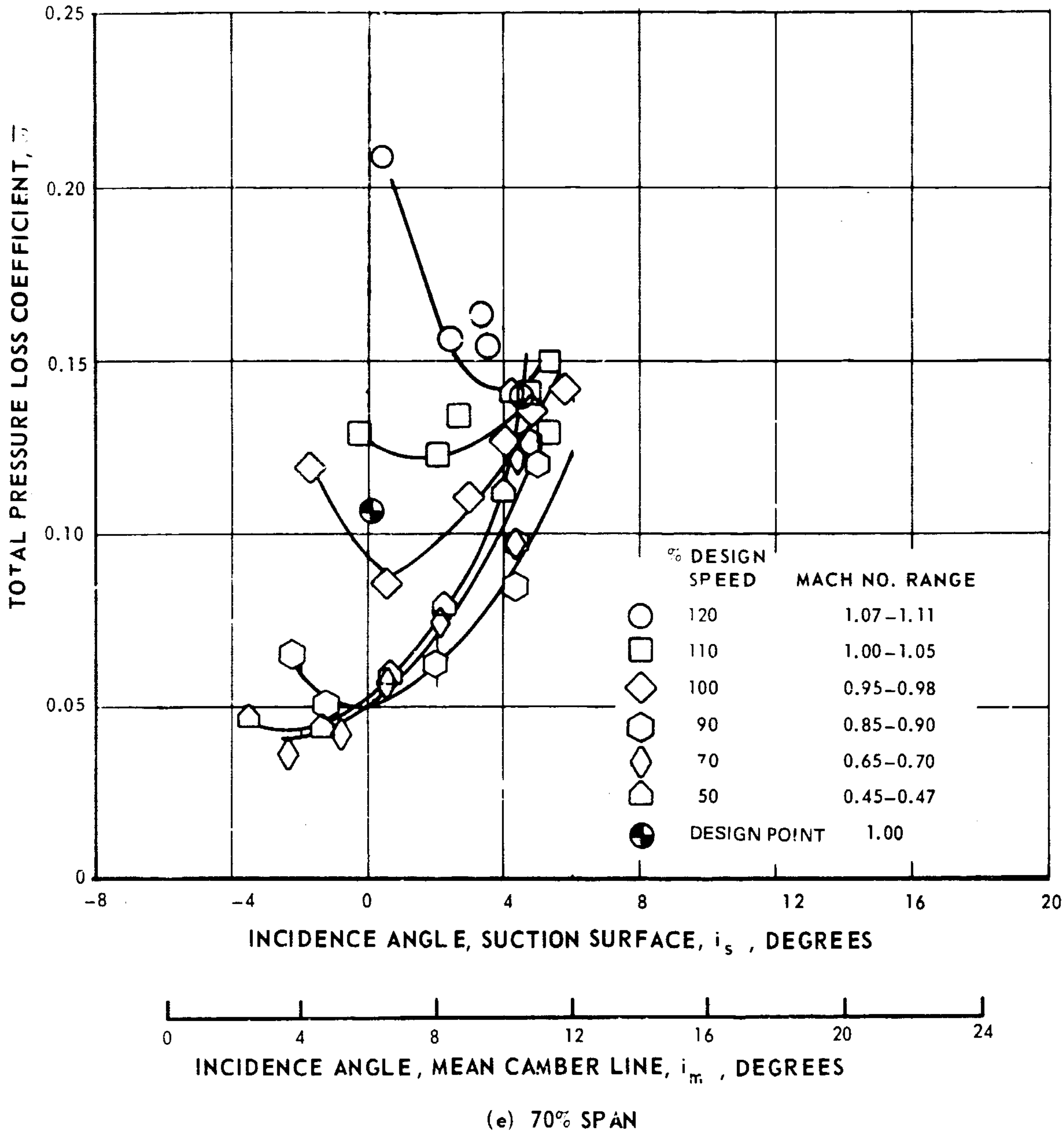
(c) 30% SPAN

Figure 12 MCA Stator B, Total Pressure Loss Coefficient vs. Incidence



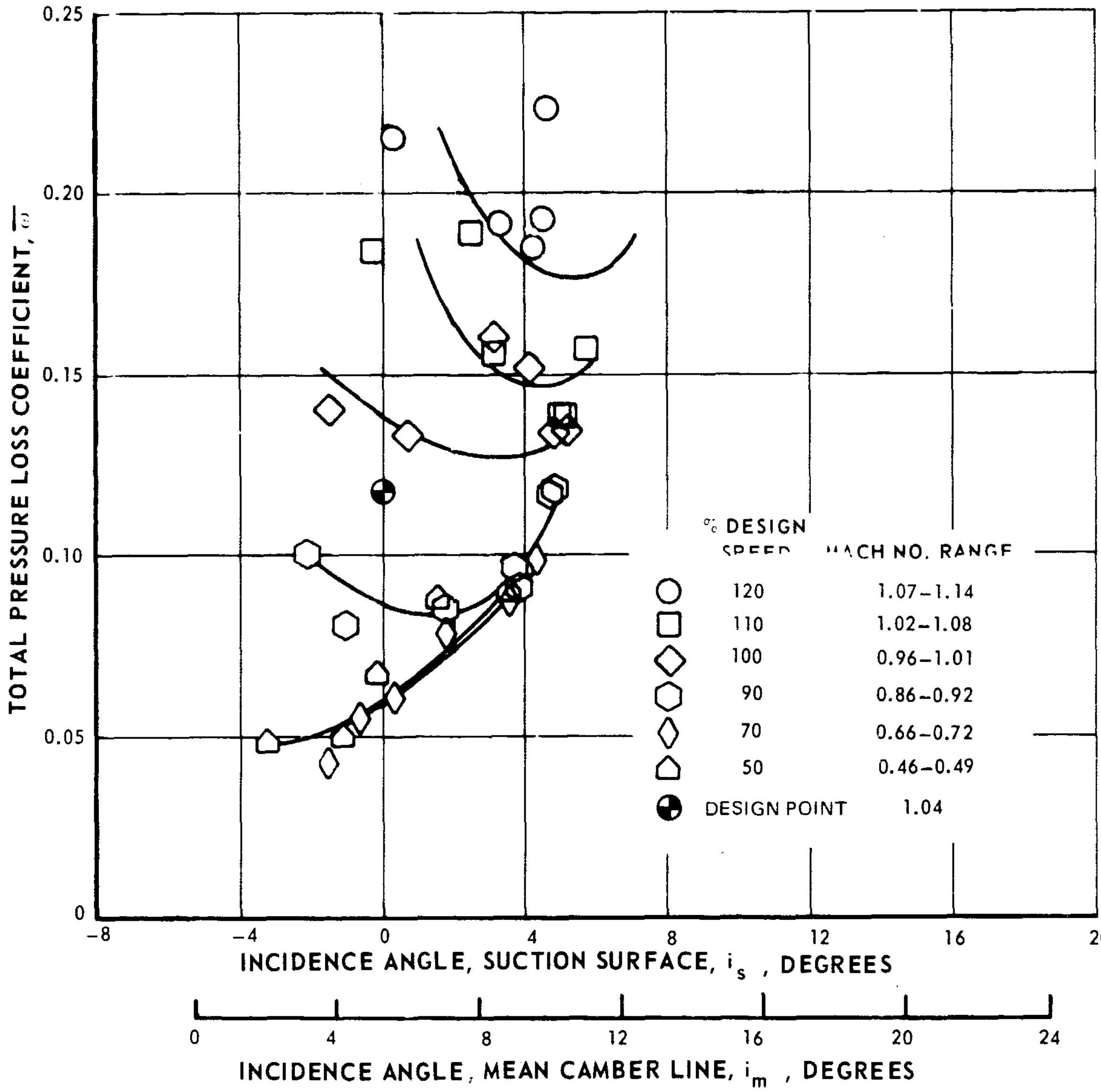
(d) 50% SPAN

Figure 12 MCA Stator B, Total Pressure Loss Coefficient vs. Incidence



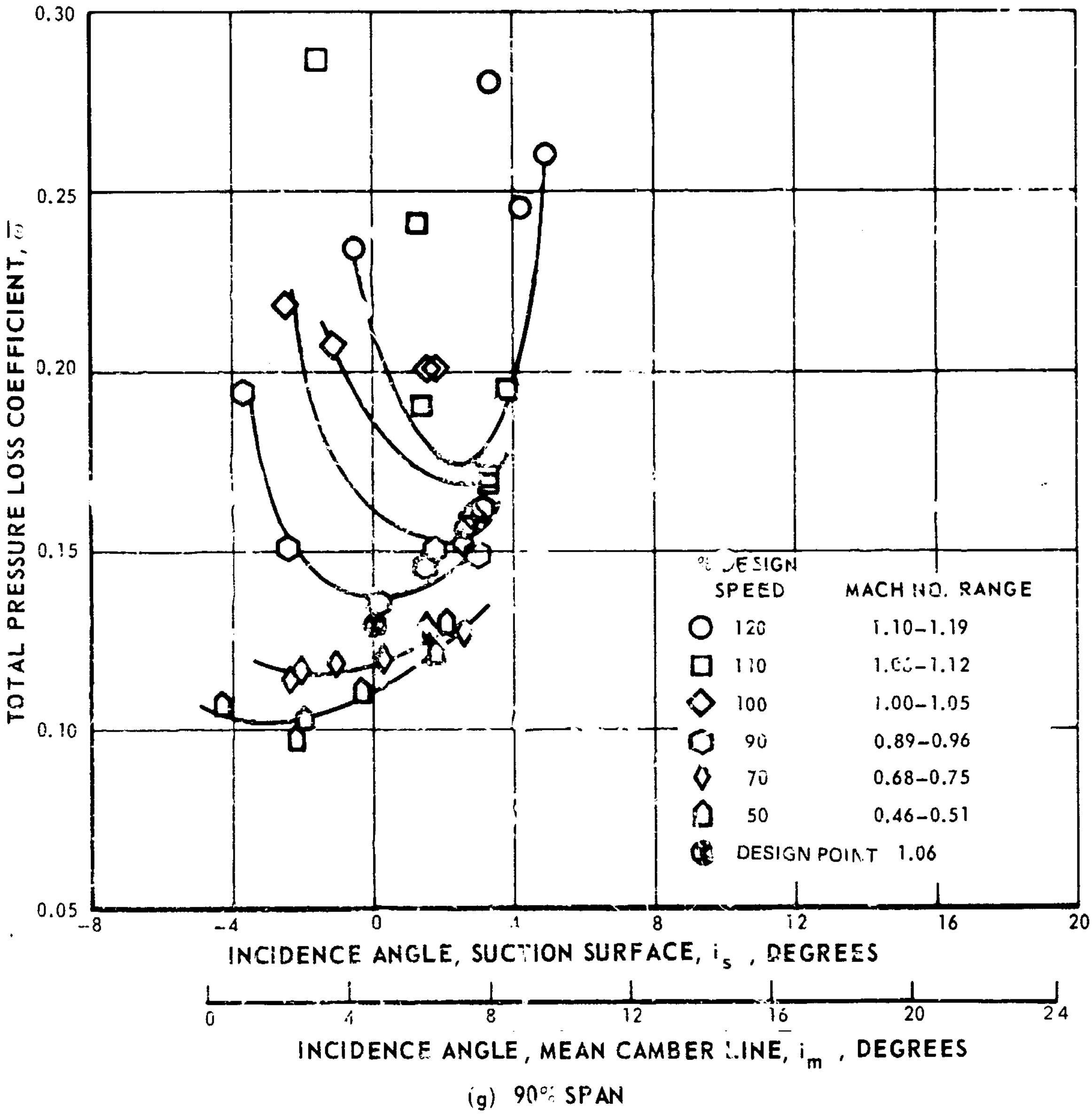
(e) 70% SPAN

Figure 12 MCA Stator B, Total Pressure Loss Coefficient vs. Incidence



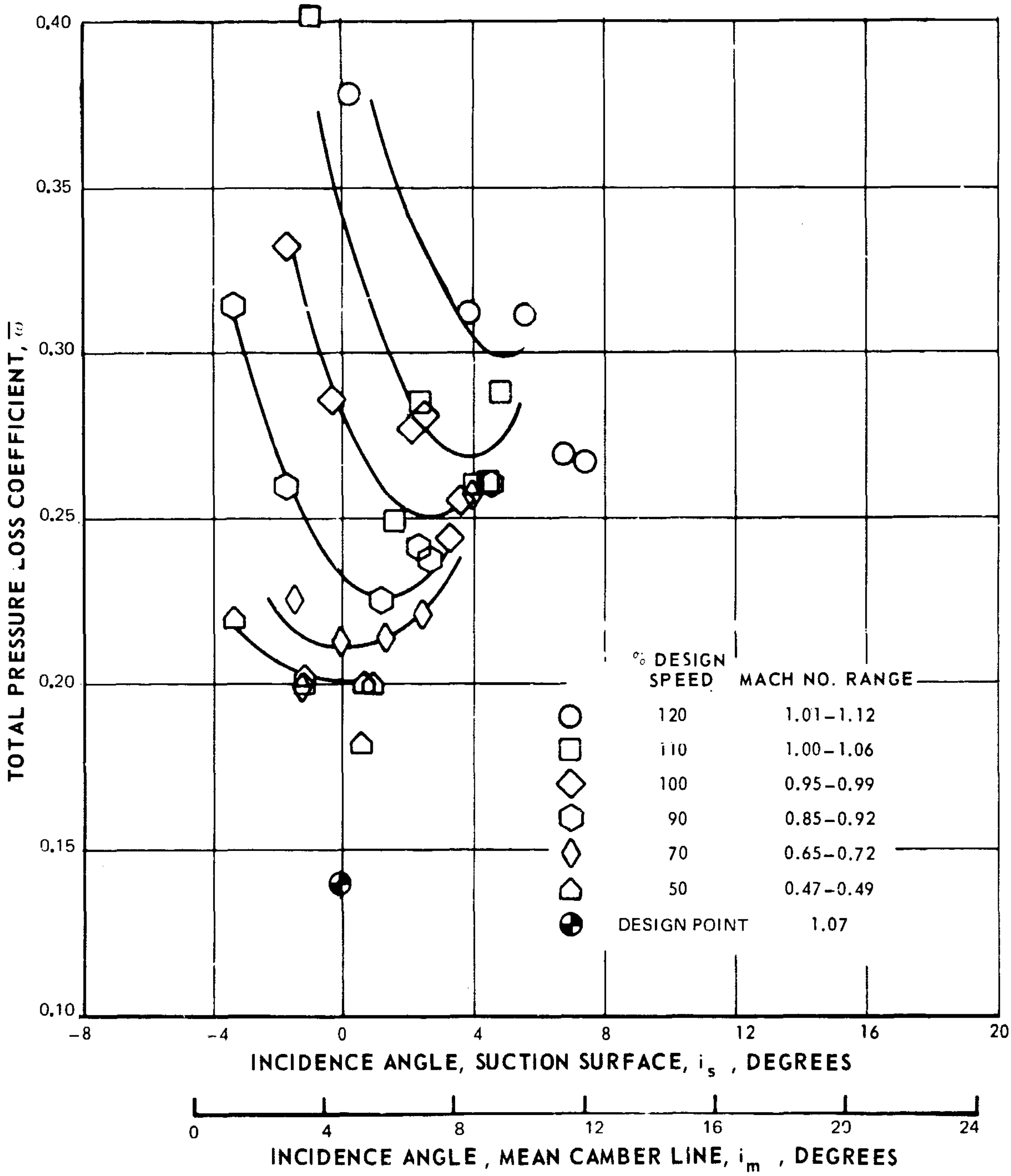
(f) 80% SPAN

Figure 12 MCA Stator B, Total Pressure Loss Coefficient vs. Incidence



(g) 90% SPAN

Figure 12 MCA Stator B, Total Pressure Loss Coefficient vs. Incidence



(h) 95% SPAN

Figure 12 MCA Stator B, Total Pressure Loss Coefficient vs. Incidence

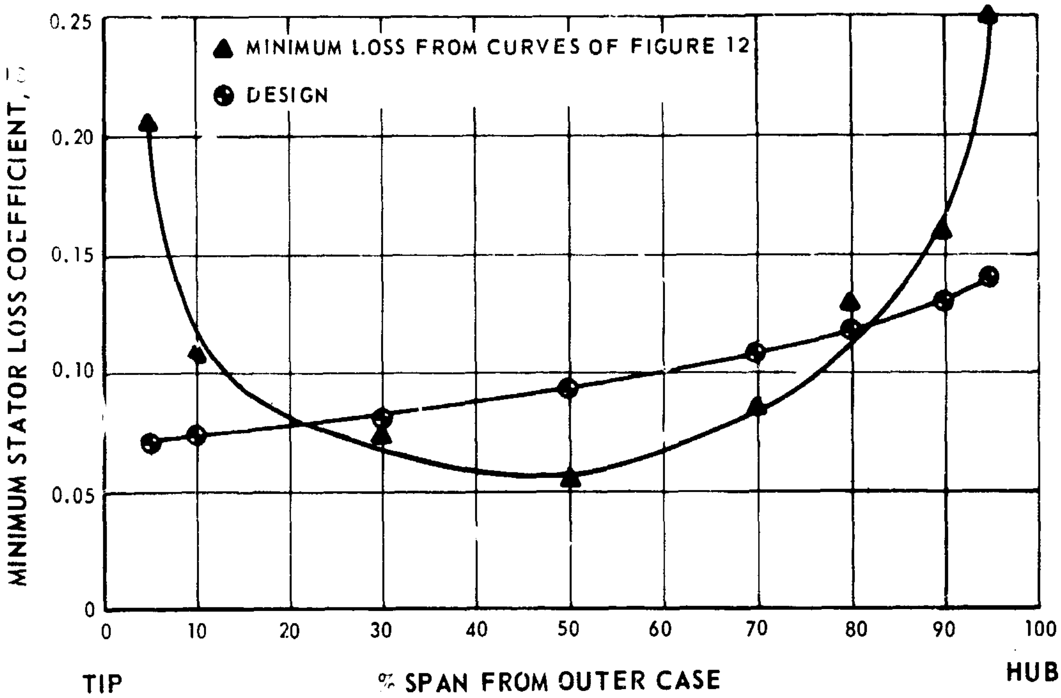


Figure 13 MCA Stator B, Minimum Stator Loss Coefficient vs. Percent Span, 100% Design Speed

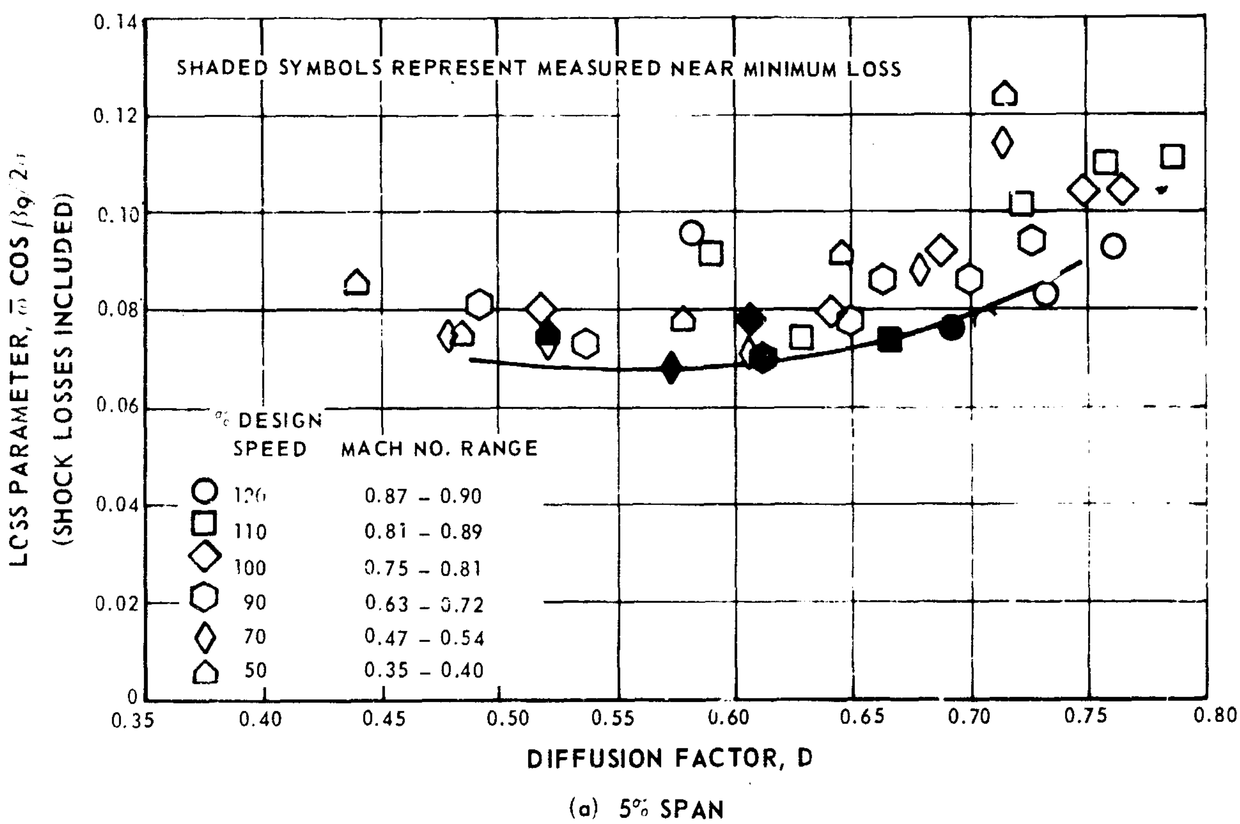
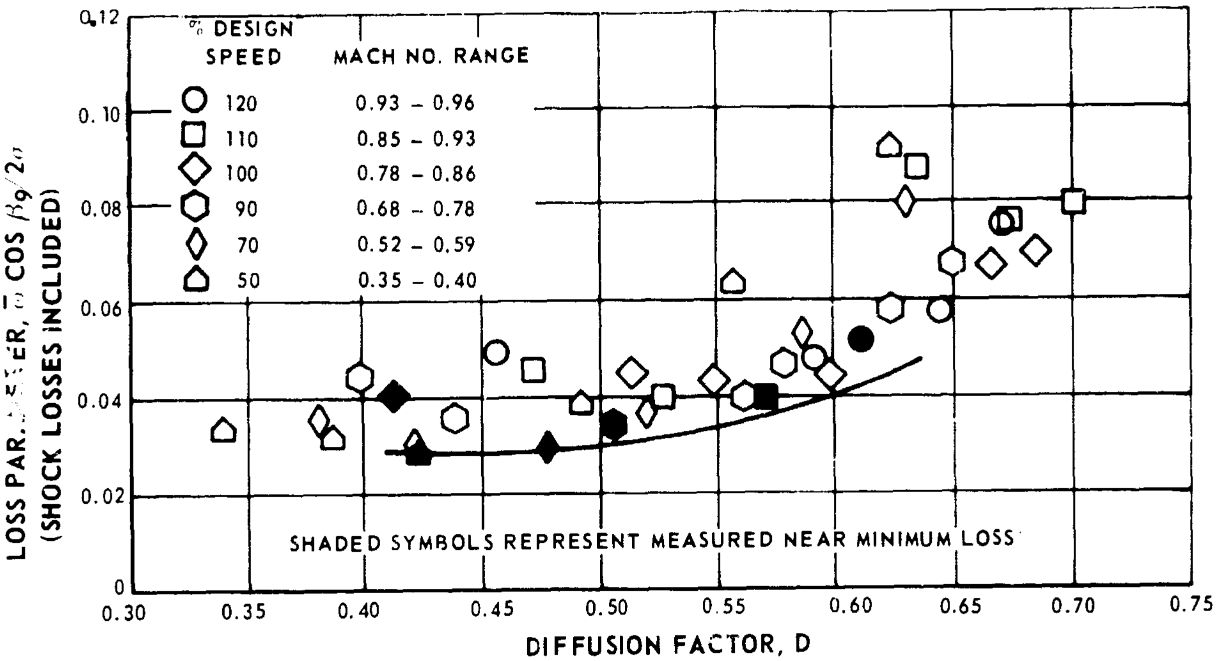
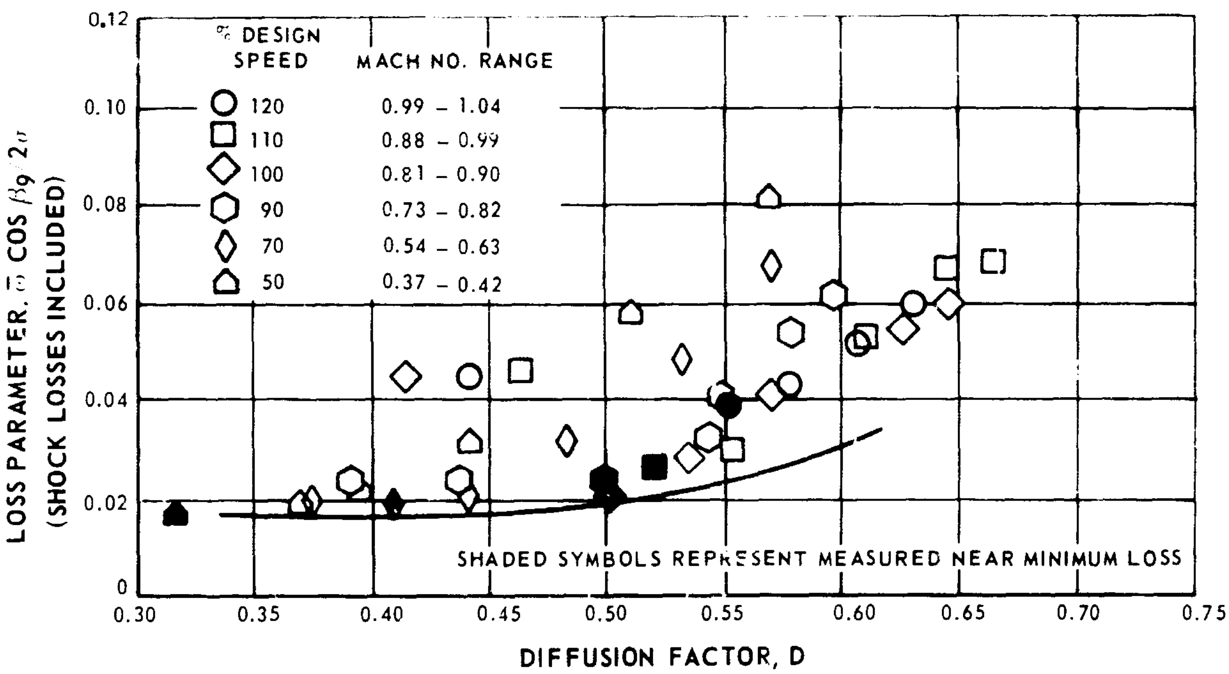


Figure 14 MCA Stator B, Loss Parameter vs. Diffusion Factor



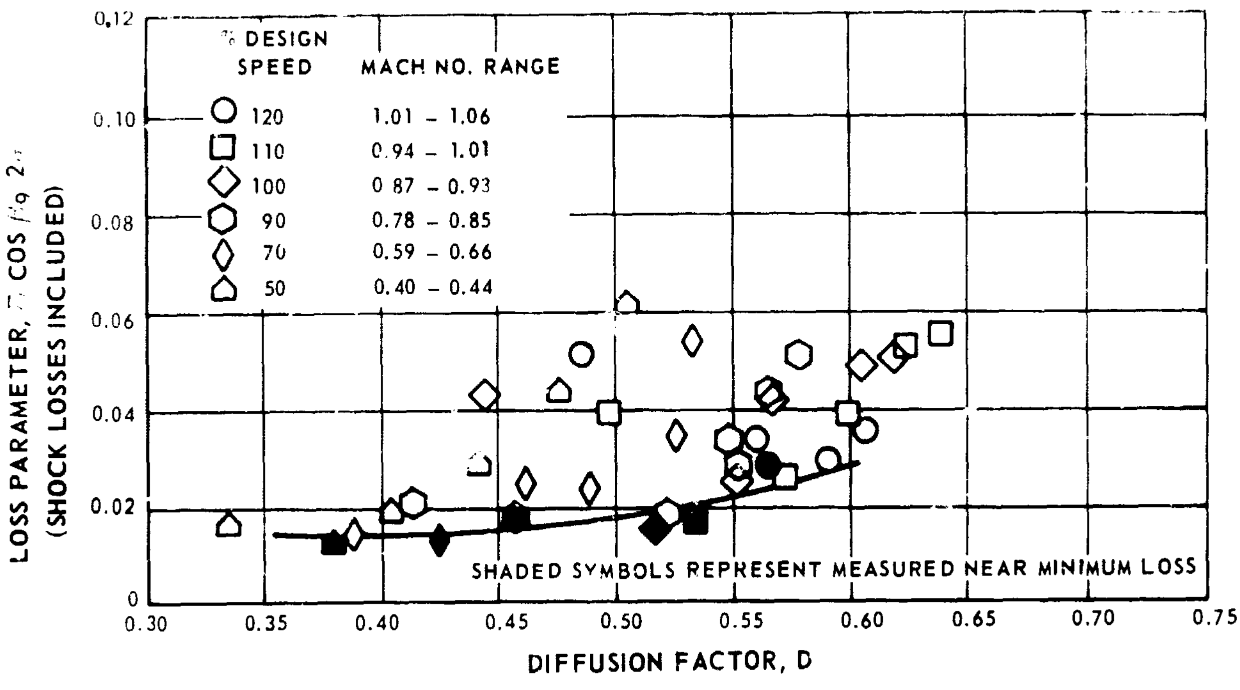
(b) 10% SPAN

Figure 14 MCA Stator B, Loss Parameter vs. Diffusion Factor



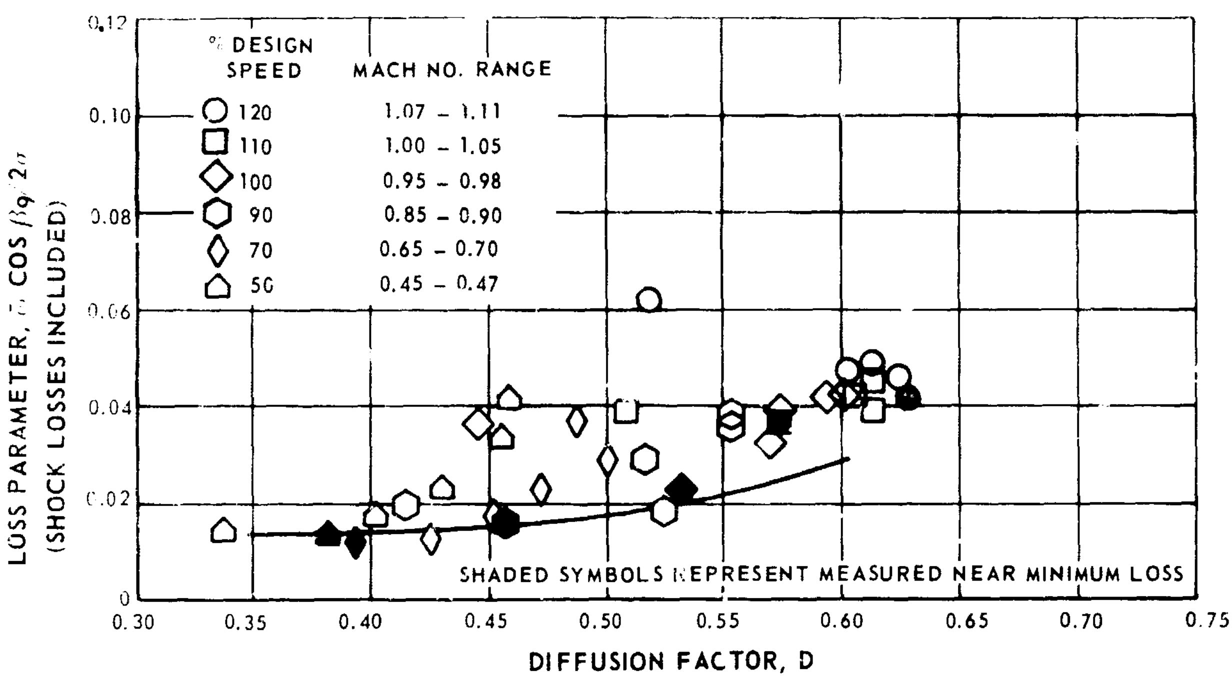
(c) 30% SPAN

Figure 14 MCA Stator B, Loss Parameter vs. Diffusion Factor



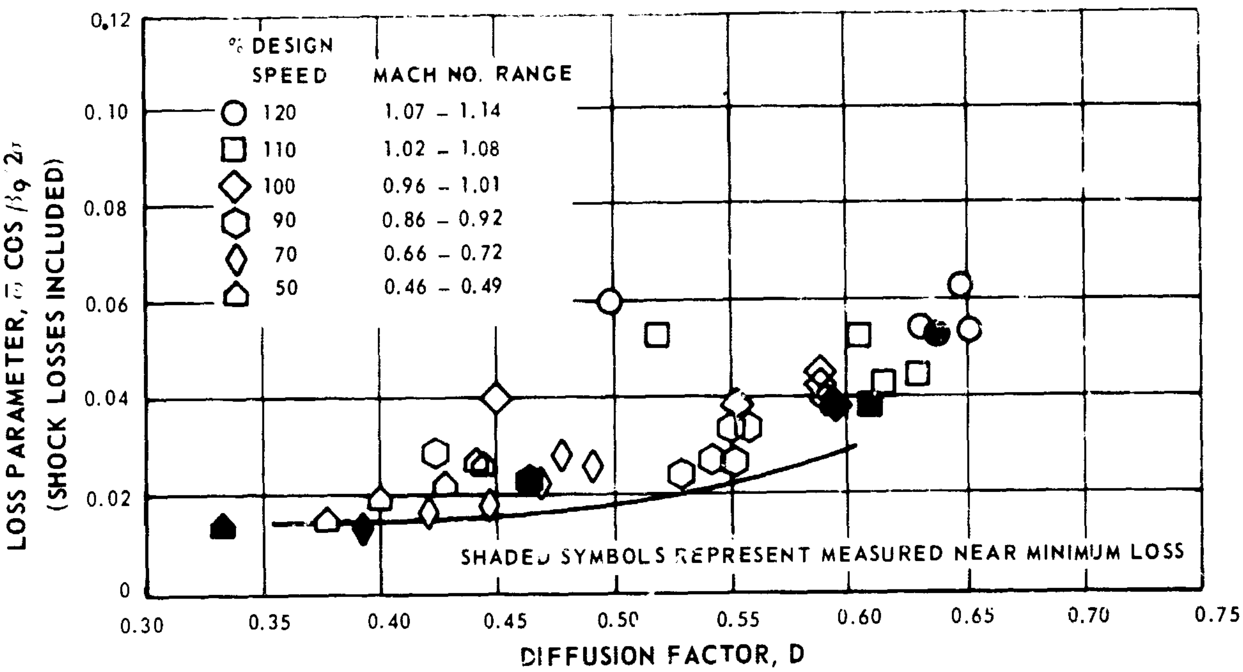
(d) 50% SPAN

Figure 14 MCA Stator B, Loss Parameter vs. Diffusion Factor



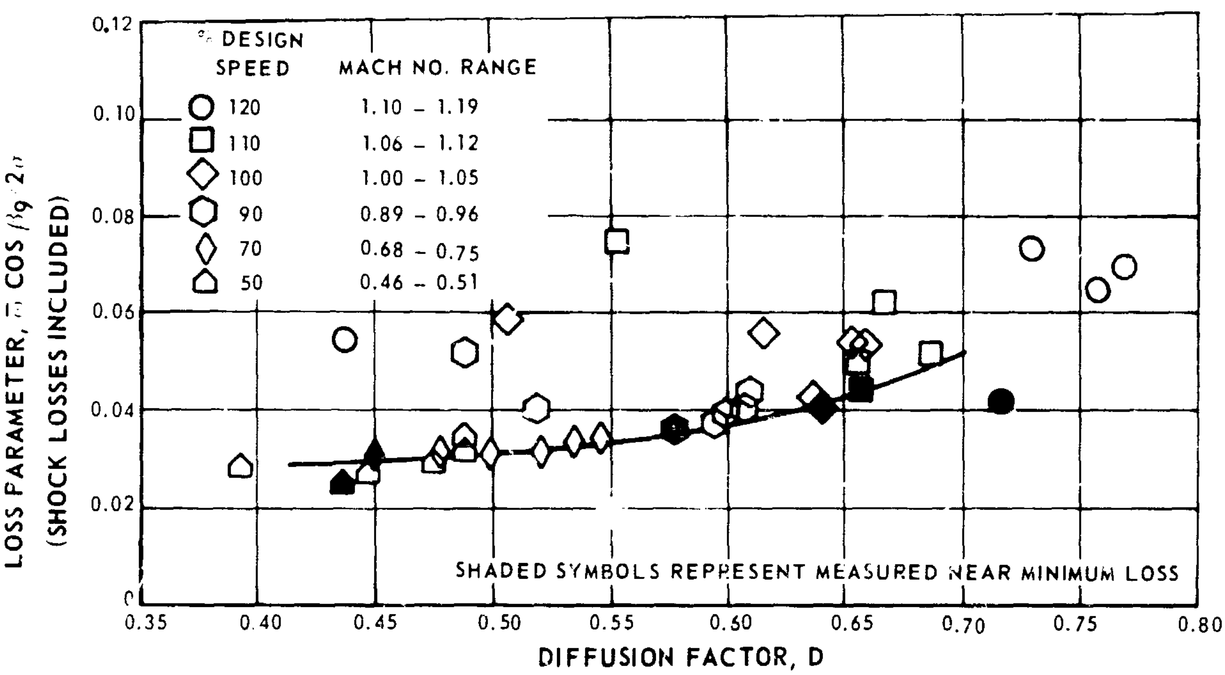
(e) 70% SPAN

Figure 14 MCA Stator B, Loss Parameter vs. Diffusion Factor



(f) 80% SPAN

Figure 14 MCA Stator B, Loss Parameter vs. Diffusion Factor



(g) 90% SPAN

Figure 14 MCA Stator B, Loss Parameter vs. Diffusion Factor

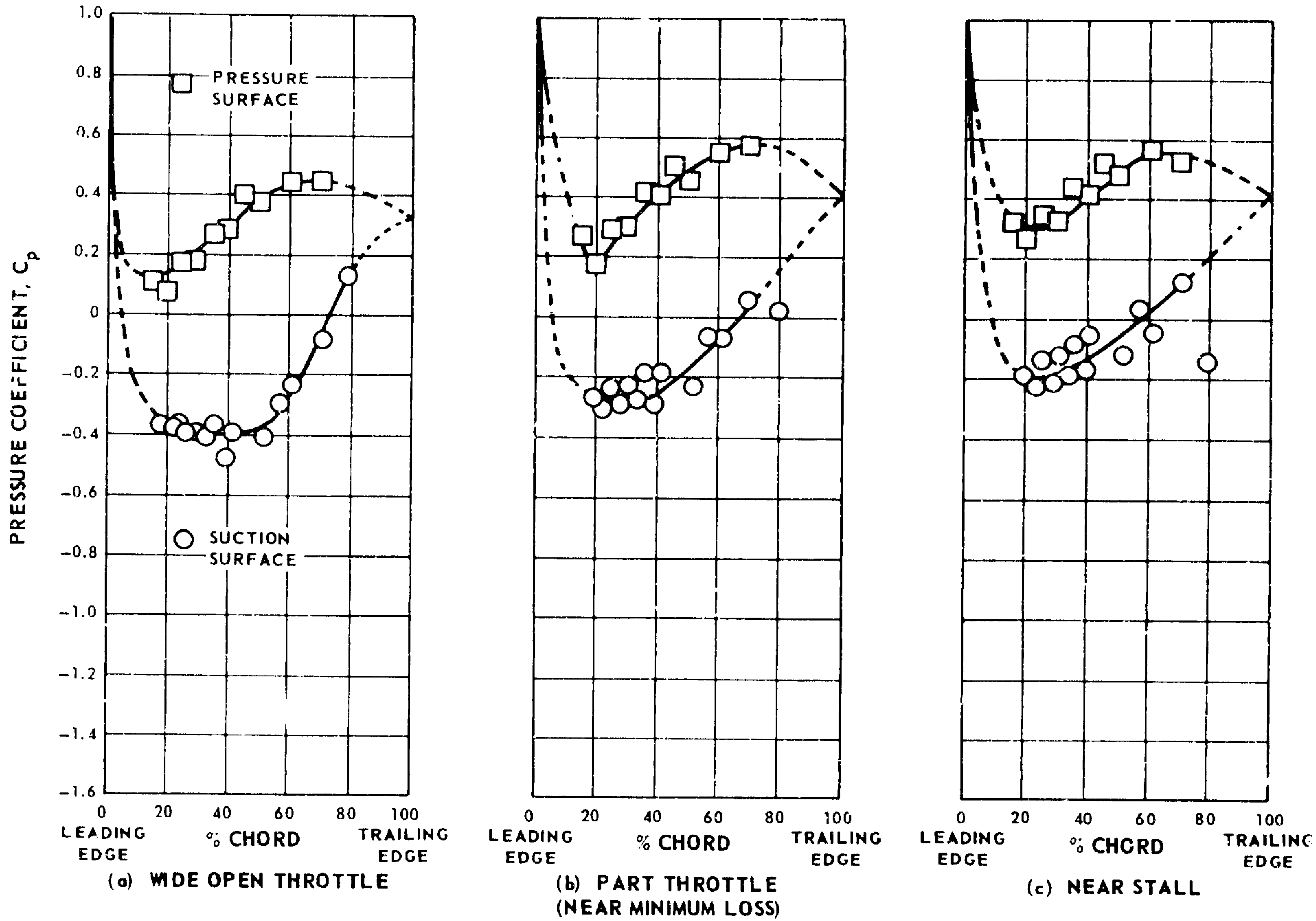


Figure 18 MCA Stator B, Pressure Coefficient (C_p) vs. Percent Chord, 50% Design Speed, 90% Span

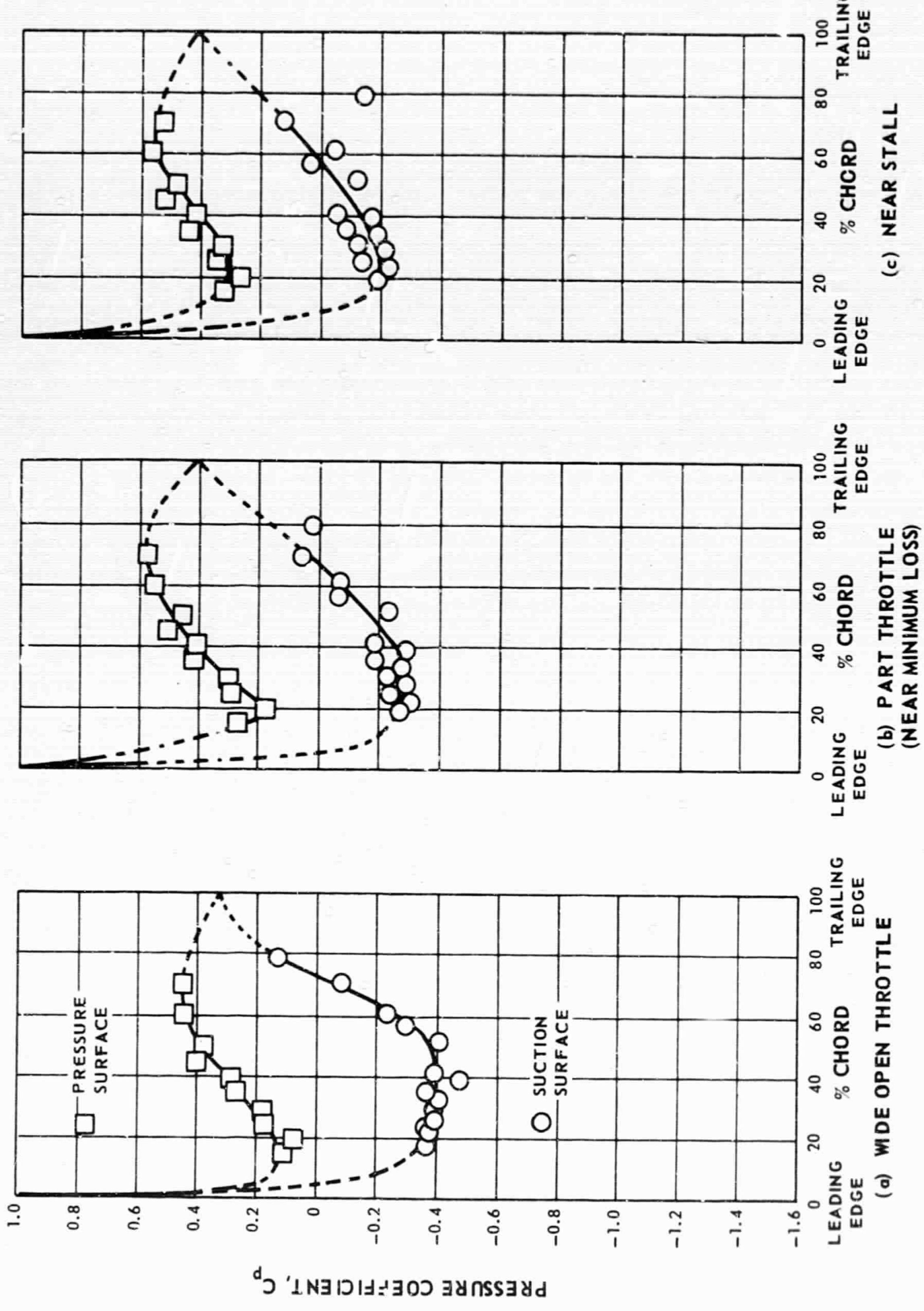


Figure 18 MCA Stator B, Pressure Coefficient (C_p) vs. Percent Chord, 50% Design Speed, 90% Span

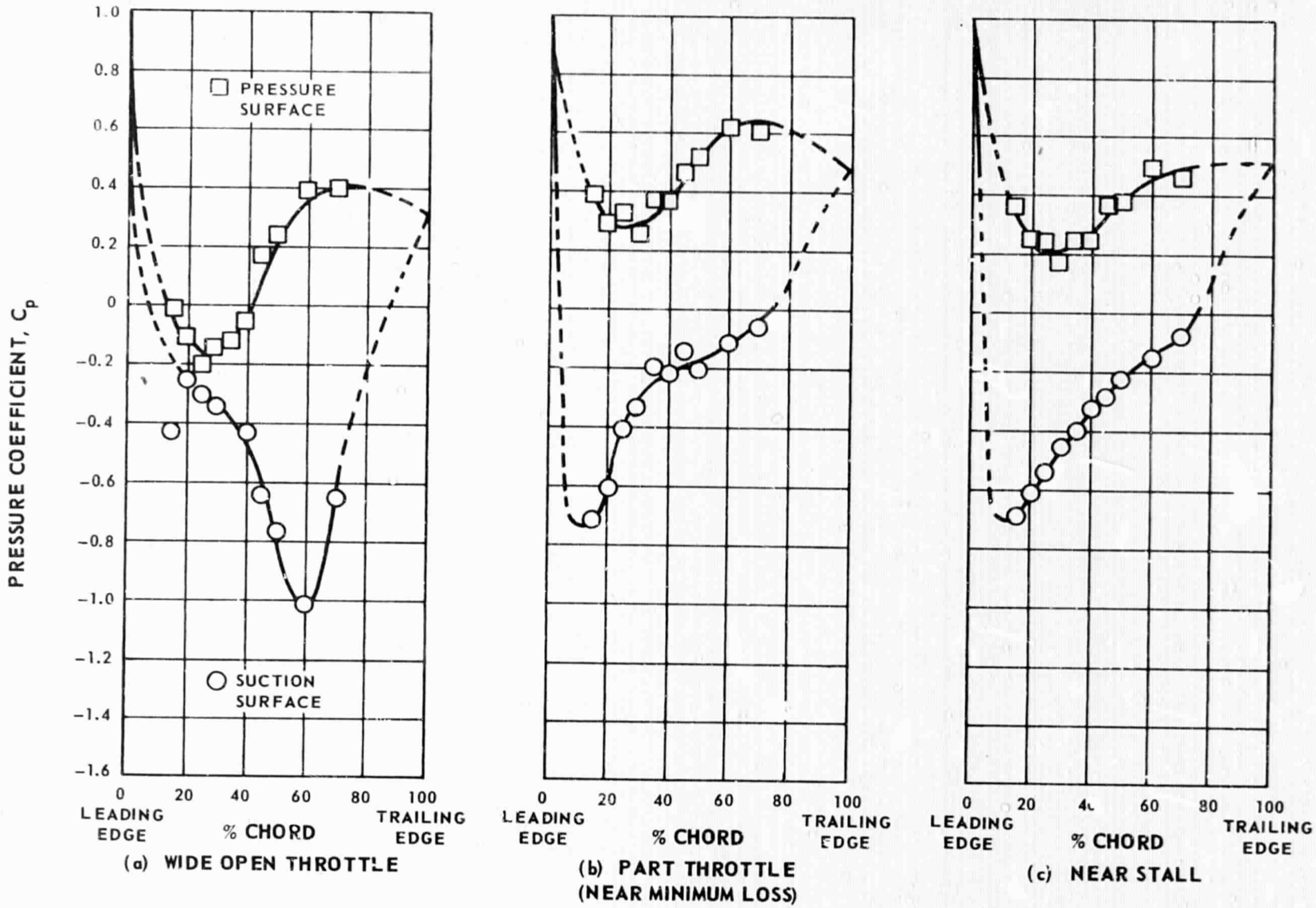


Figure 19 MCA Stator B, Pressure Coefficient (C_p) vs. Percent Chord, 100% Design Speed, 10% Span

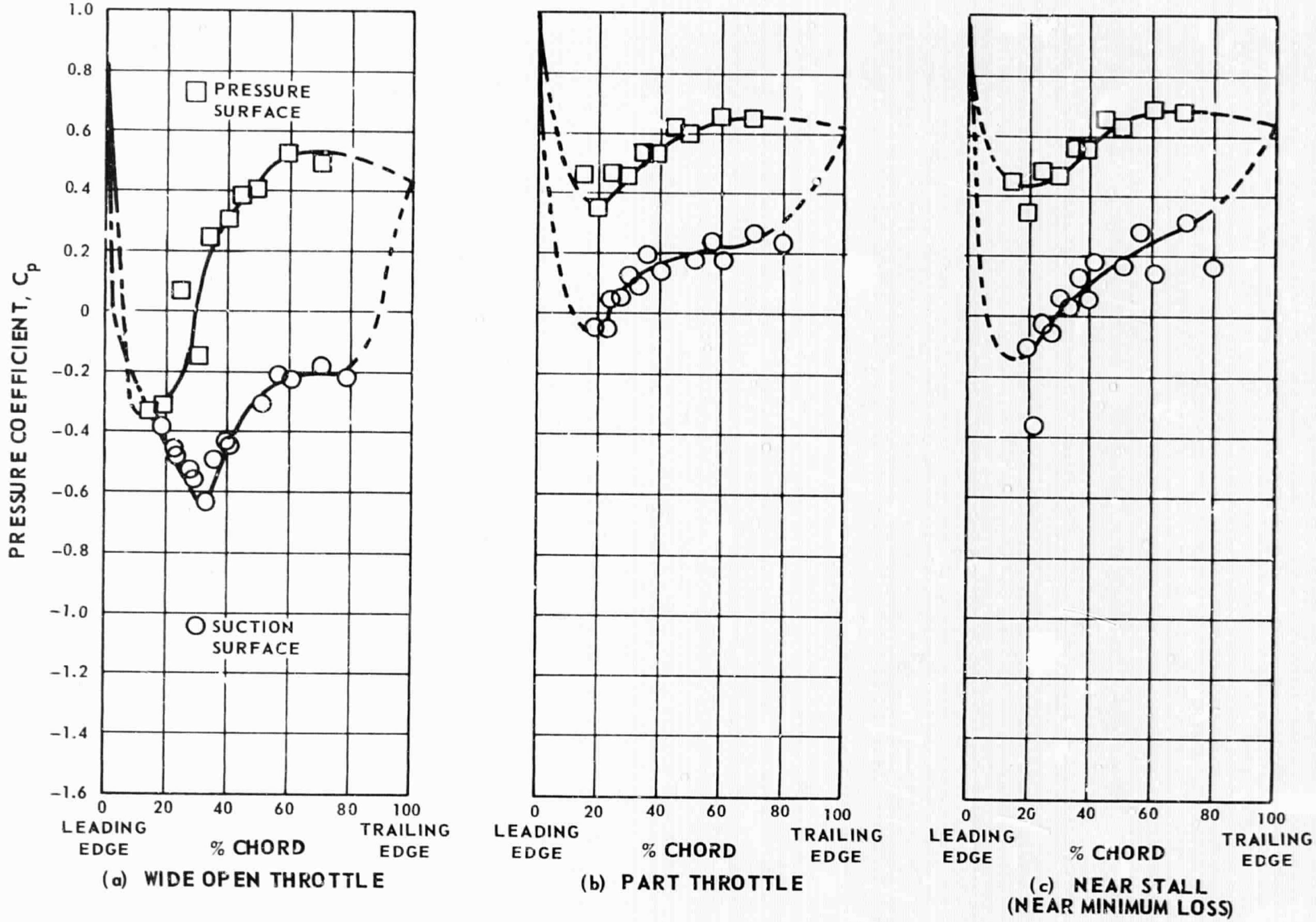


Figure 20 MCA Stator B, Pressure Coefficient (C_p) vs. Percent Chord, 100% Design Speed, 90% Span

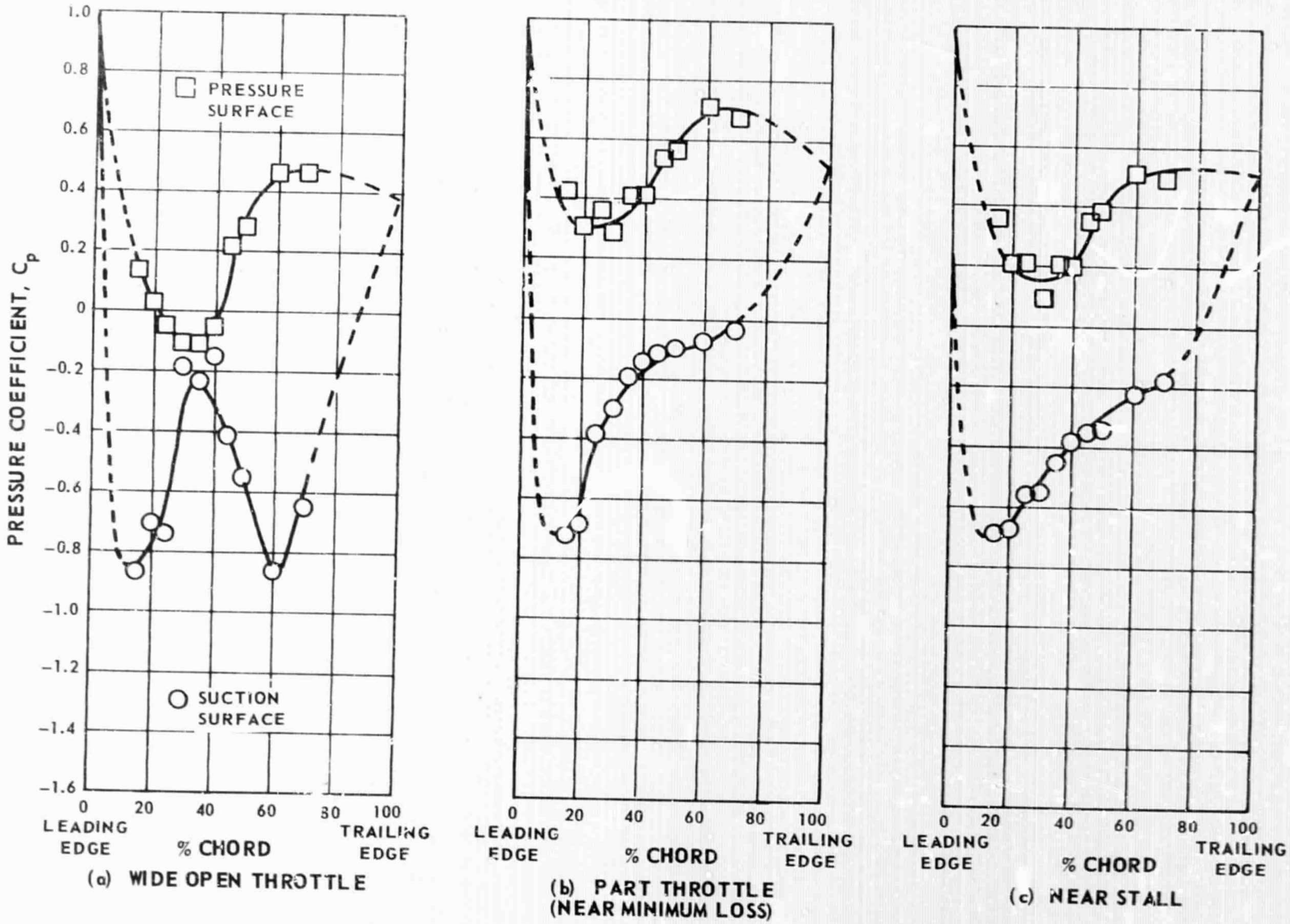


Figure 21 MCA Stator B, Pressure Coefficient (Cp) vs. Percent Chord, 110% Design Speed, 10% Span

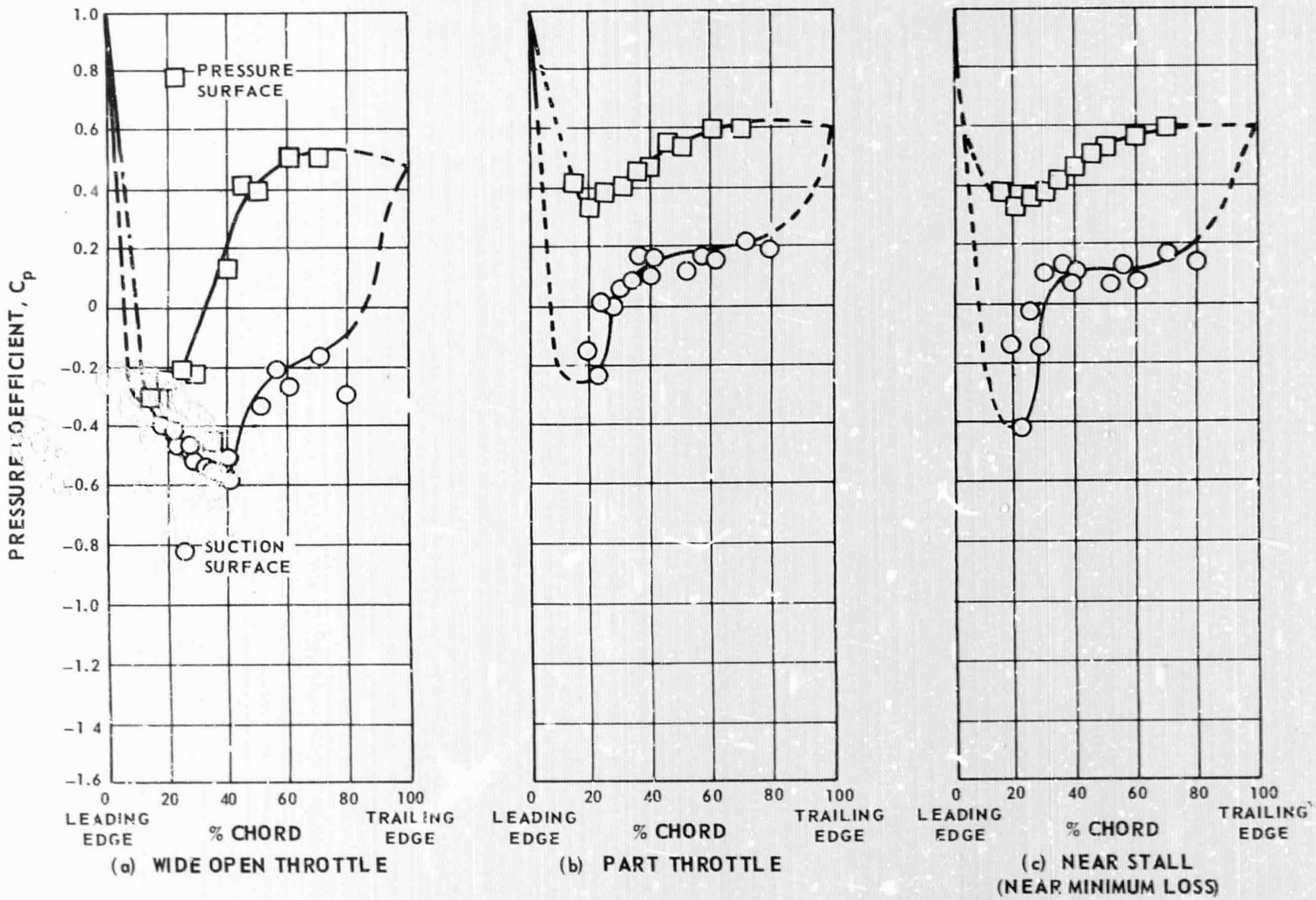


Figure 22 MCA Stator B, Pressure Coefficient (C_p) vs. Percent Chord, 110% Design Speed, 90% Span

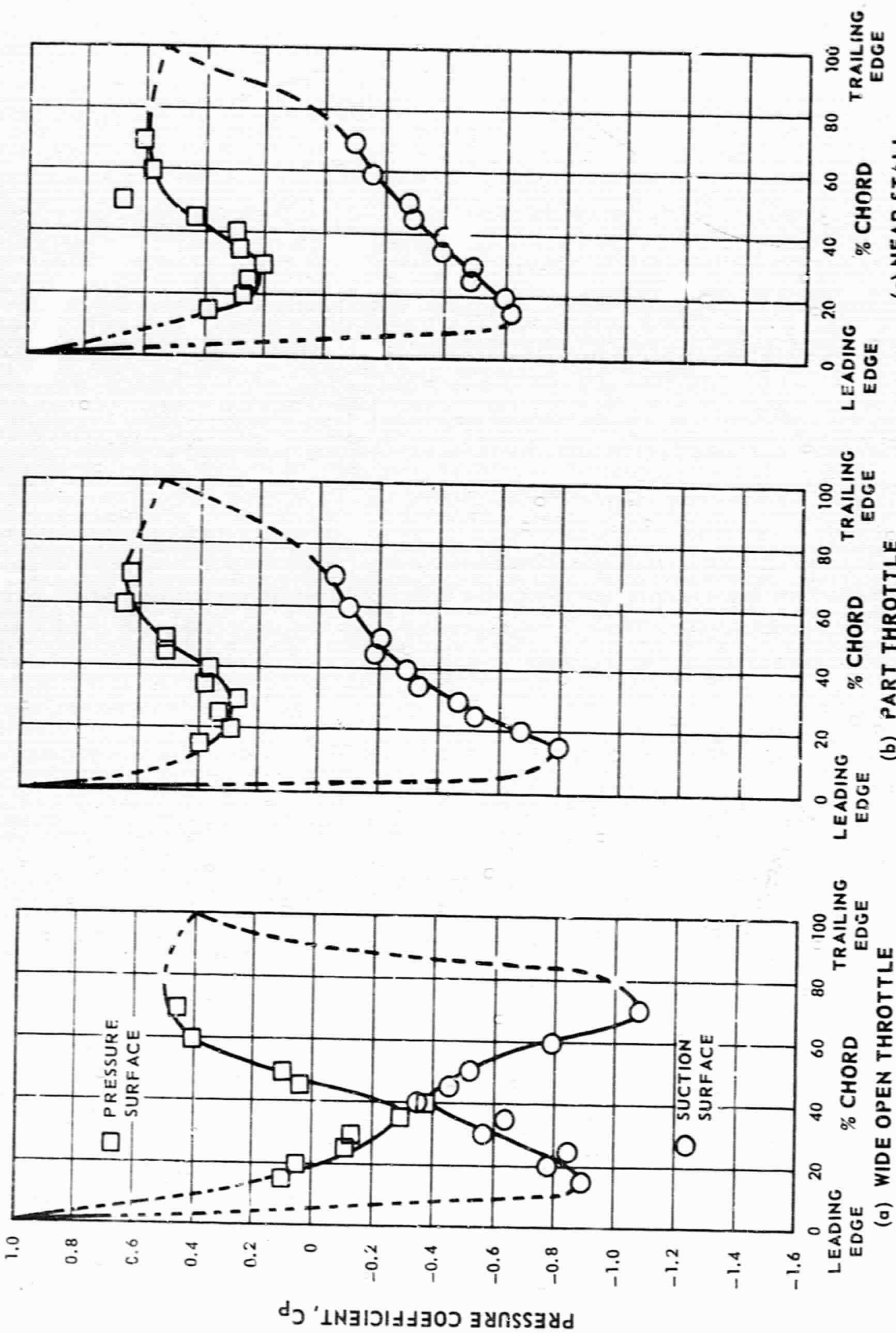


Figure 23 MCA Stator B, Pressure Coefficient (C_p) vs. Percent Chord, 120% Design Speed, 10% Span

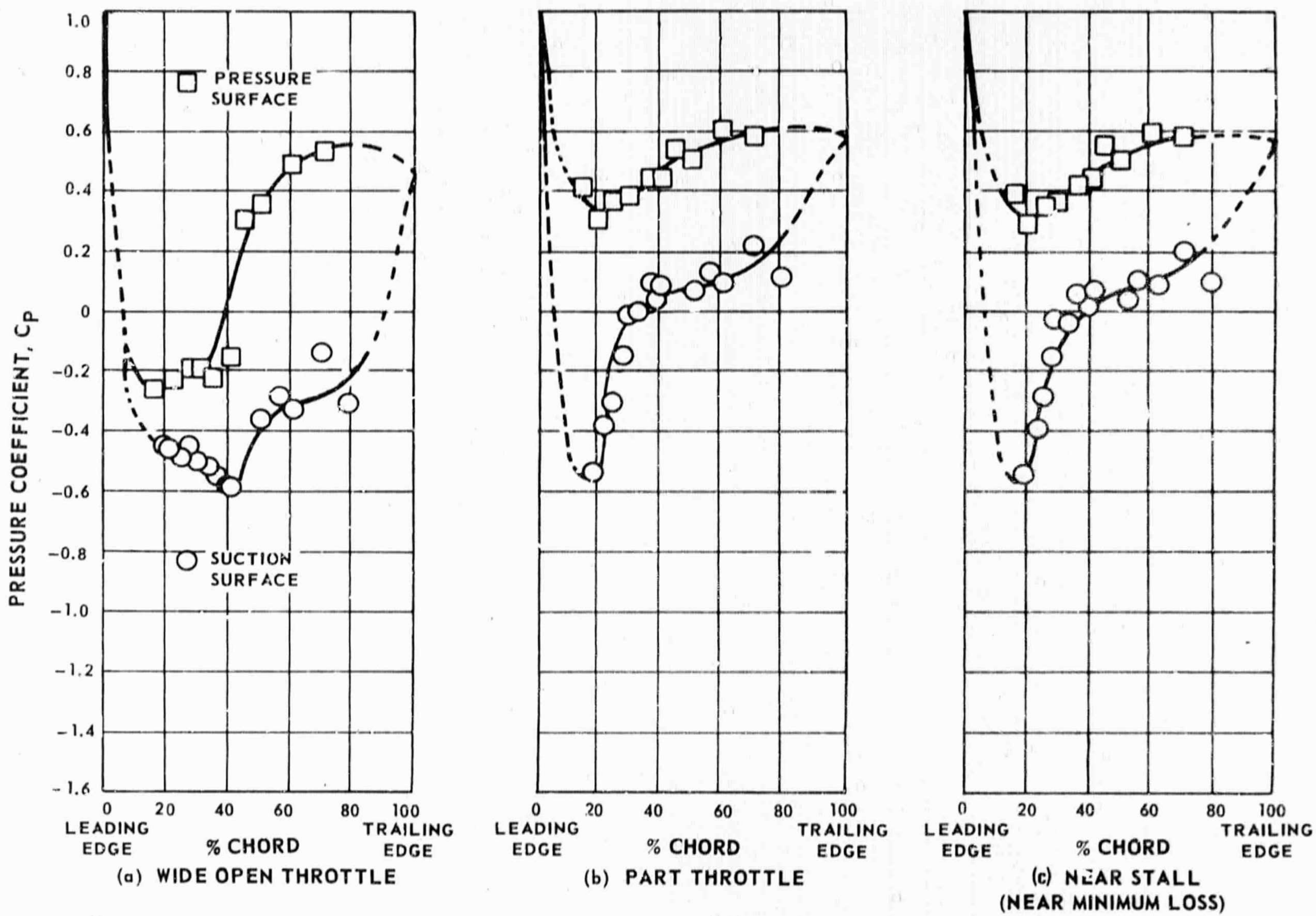


Figure 24 MCA Stator B, Pressure Coefficient (C_p) vs. Percent Chord, 120% Design Speed, 90% Span

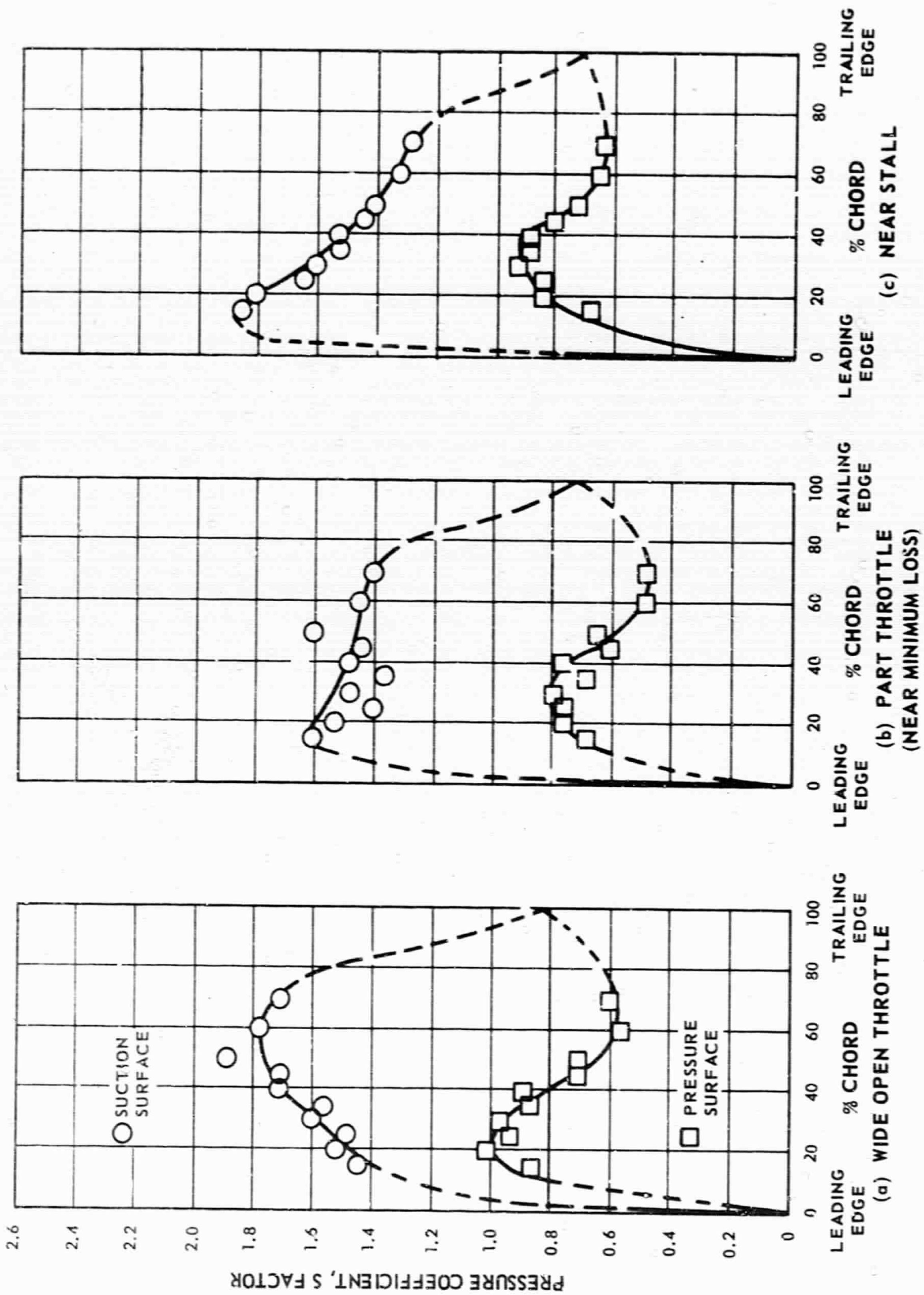


Figure 25 MCA Stator B, Pressure Coefficient (S Factor) vs. Percent Chord, 50% Design Speed, 10% Span

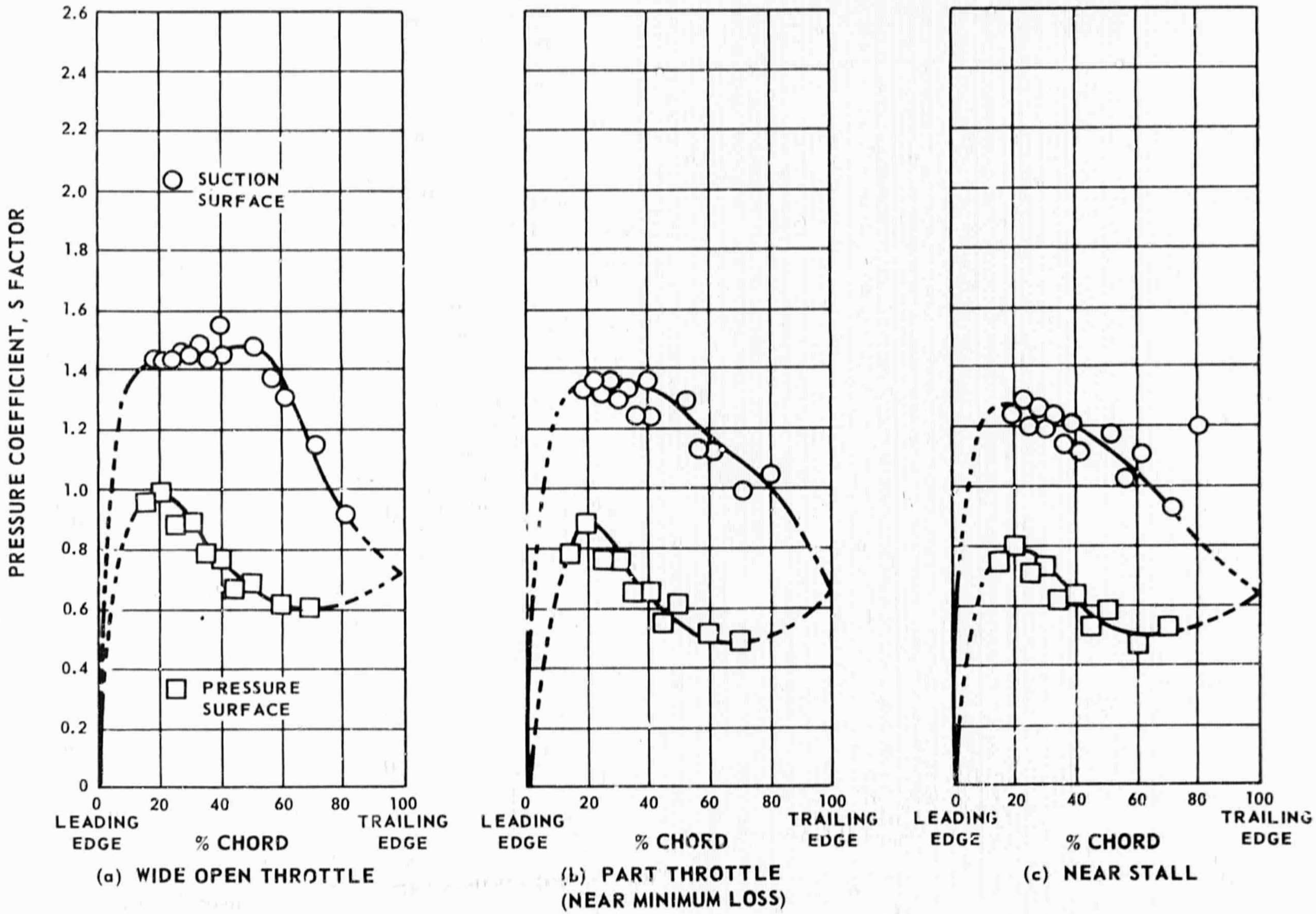


Figure 26 MCA Stator B, Pressure Coefficient (S Factor) vs. Percent Chord, 50% Design Speed, 90% Span

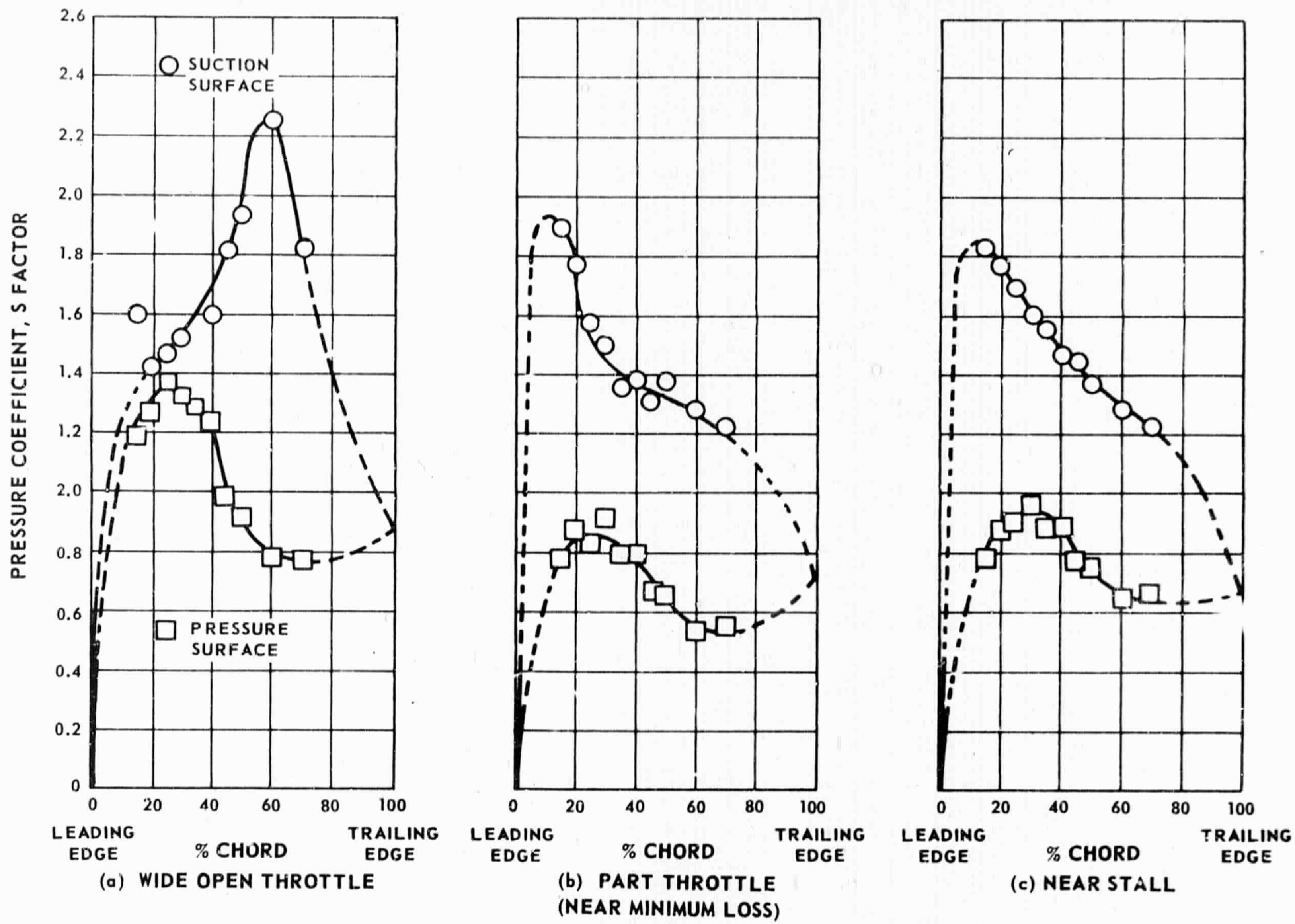


Figure 27 MCA Stator B, Pressure Coefficient (S Factor) vs. Percent Chord, 100% Design Speed, 10% Span

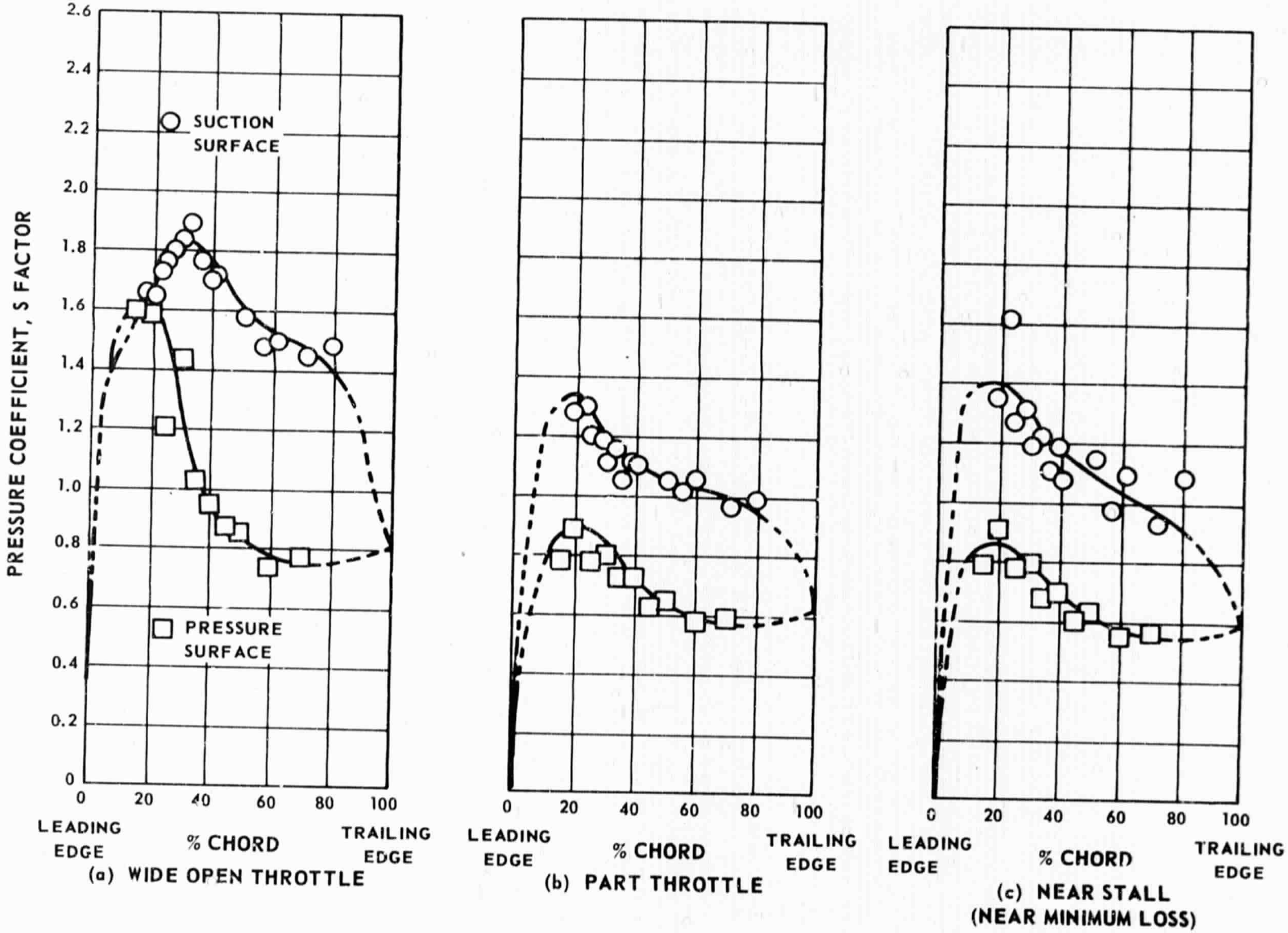


Figure 28 MCA Stator B, Pressure Coefficient (S Factor) vs. Percent Chord, 100% Design Speed, 90% Span

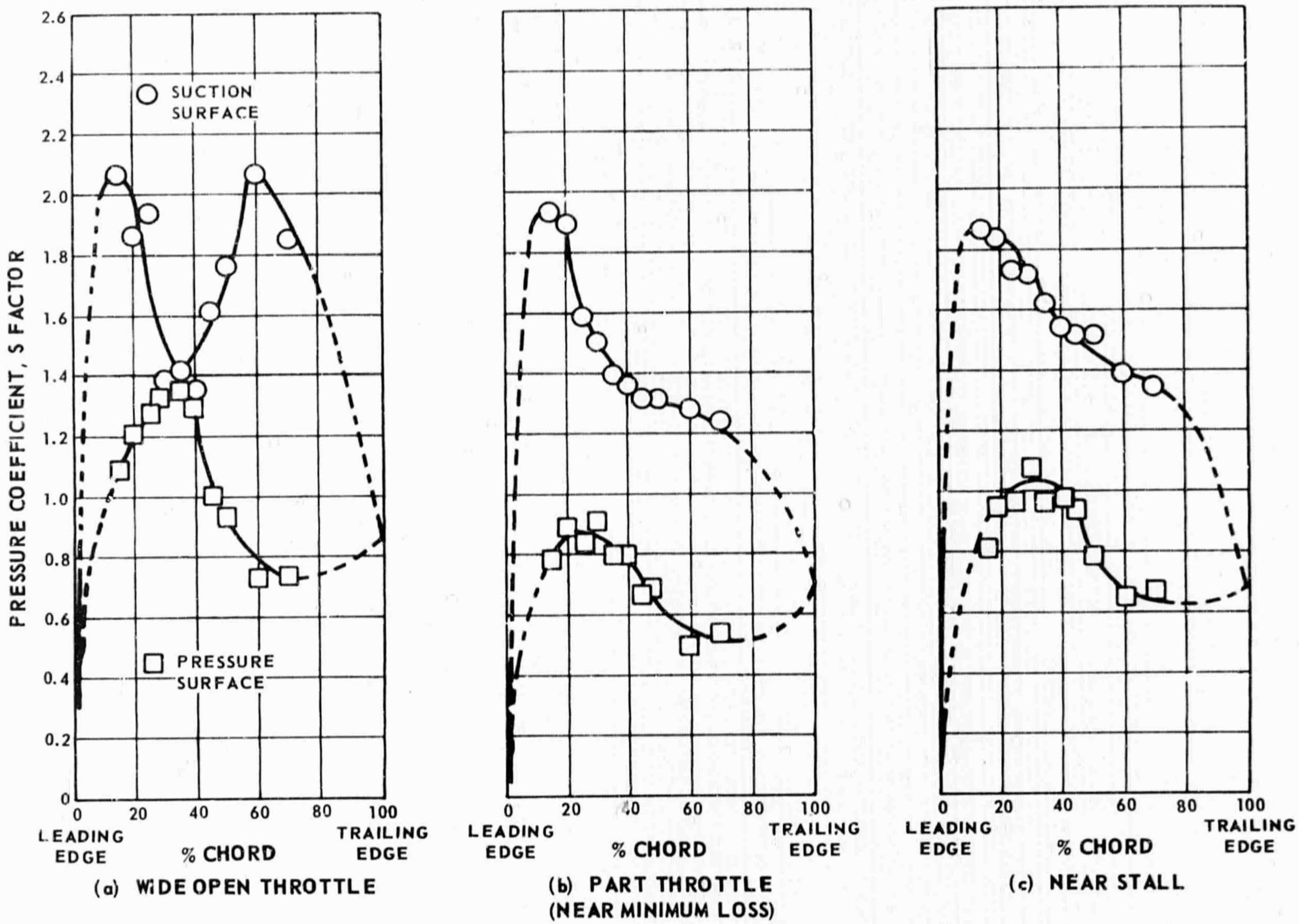
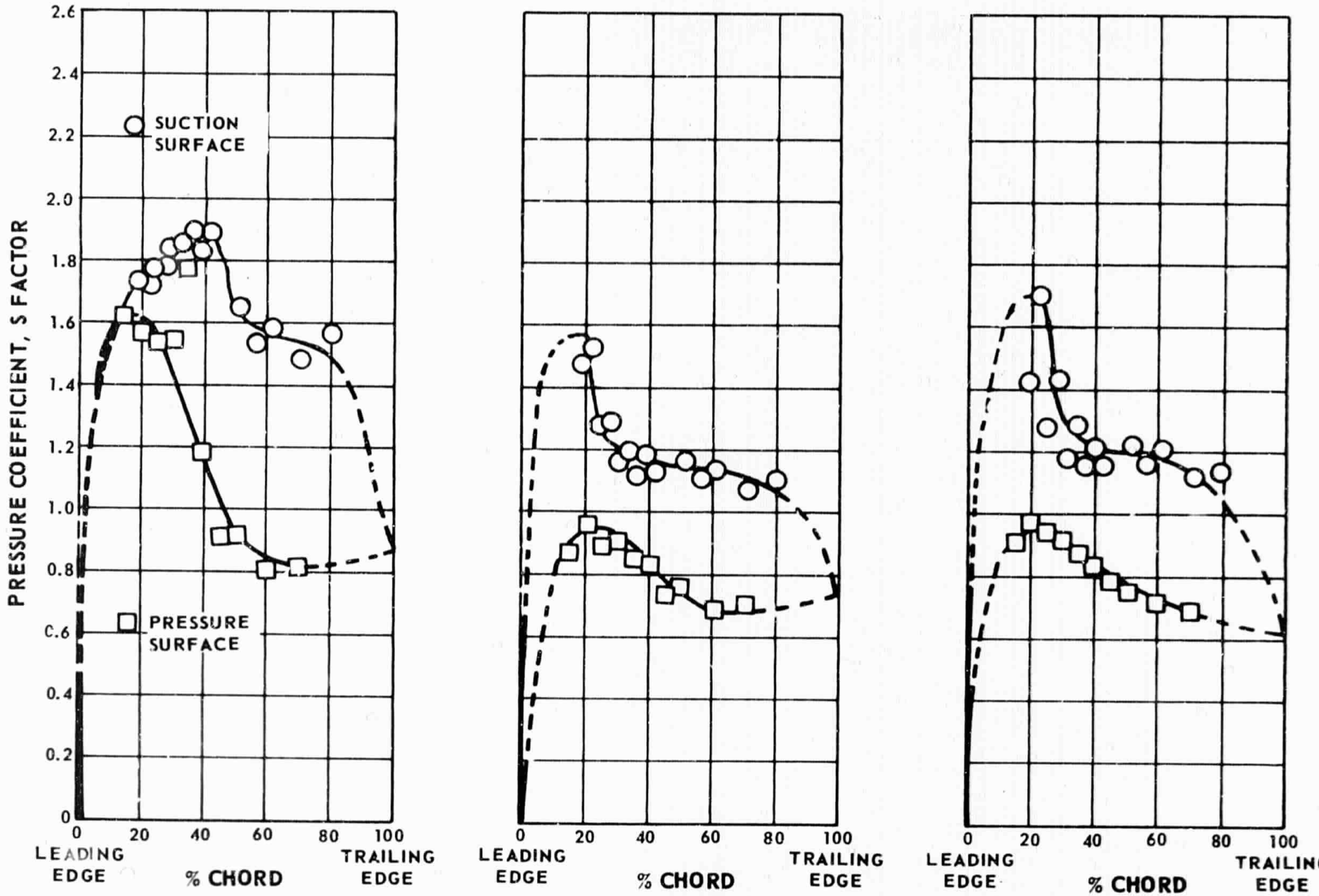


Figure 29 MCA Stator B, Pressure Coefficient (S Factor) vs. Percent Chord, 110% Design Speed, 10% Span



(a) WIDE OPEN THROTTLE

(b) PART THROTTLE

(c) NEAR STALL (NEAR MINIMUM LOSS)

Figure 30 MCA Stator B, Pressure Coefficient (S Factor) vs. Percent Chord, 110% Design Speed, 90% Span

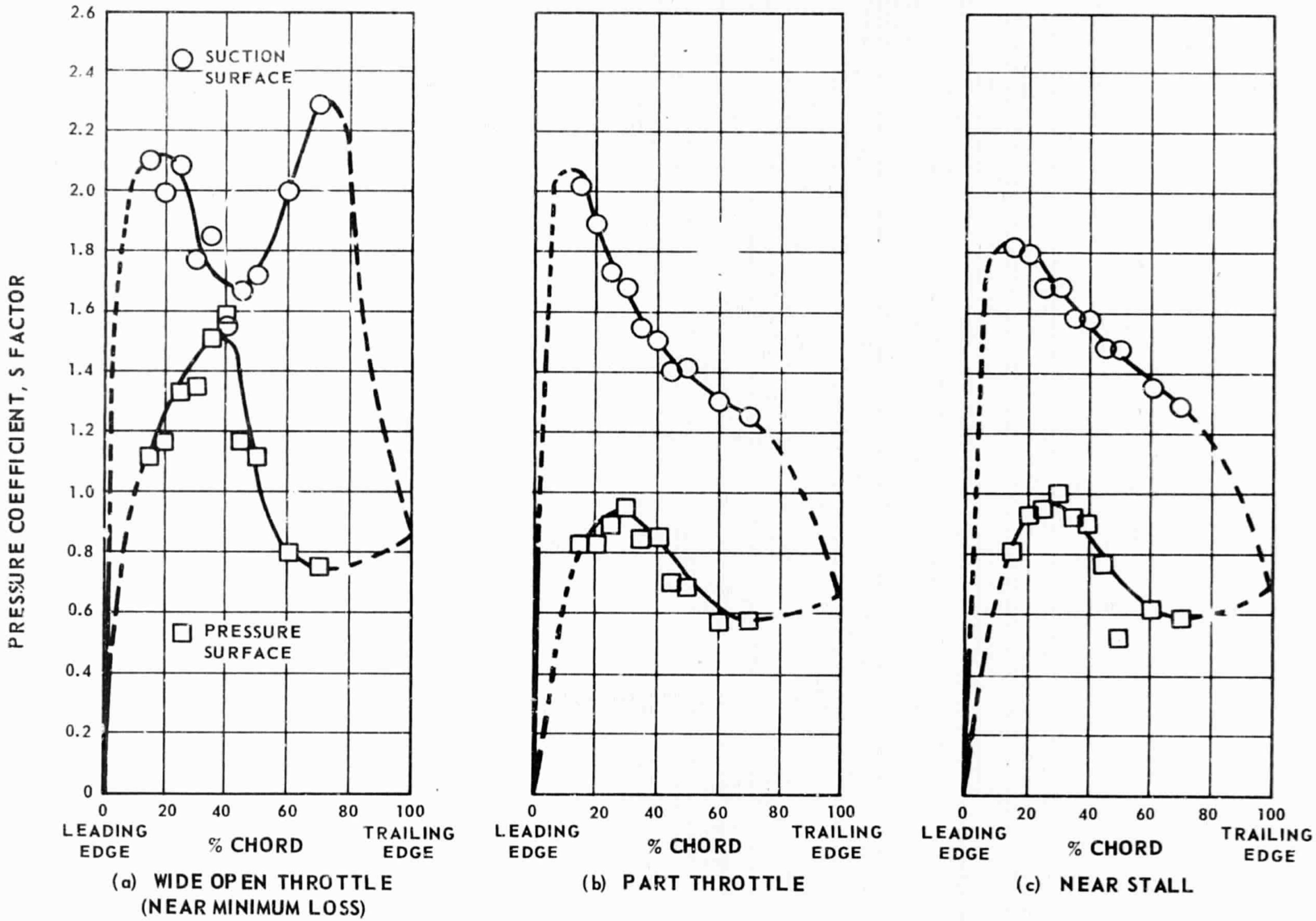


Figure 31 MCA Stator B, Pressure Coefficient (S Factor) vs. Percent Chord, 120% Design Speed, 10% Span

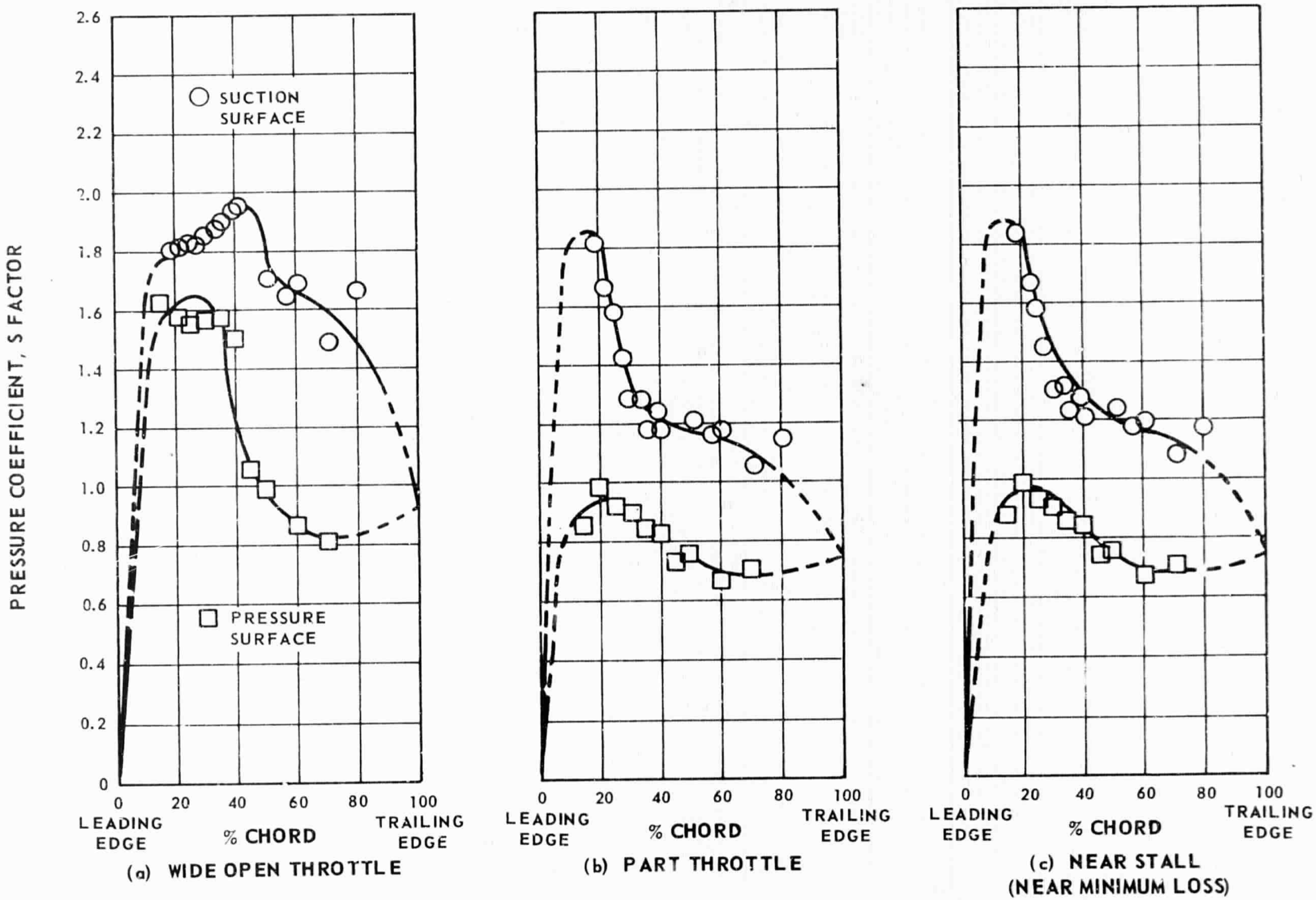


Figure 32 MCA Stator B, Pressure Coefficient (S Factor) vs. Percent Chord, 120% Design Speed, 90% Span

APPENDIX A

BLADE ELEMENT LATA TABULATION

TABLE 1-1

BLADE ELEMENT PERFORMANCE, MCA STATOR B
50% DESIGN SPEED, POINT 1

STATOR

% SPAN	95	90	80	70	50	30	10	05
Dia.	22.300	22.6[illegible]	23.670	24.480	26.350	28.190	30.000	30.540
β_8	44.713	42.507	41.361	40.448	37.301	36.074	35.688	37.569
β_9	7.434	7.348	6.108	4.866	3.952	3.966	4.100	4.133
V_8	540.697	569.062	544.659	526.274	492.[illegible]07	471.373	448.325	412.214
V_9	392.276	430.146	447.718	436.118	413.518	403.397	377.388	312.189
V_{Z8}	383.491	418.754	408.220	400.048	391.722	380.927	364.126	326.729
V_{Z9}	387.968	425.580	444.318	433.866	412.302	4[illegible]2.314	376.401	311.369
$V_{\theta 8}$	380.412	384.505	359.913	341.426	298.583	277.558	261.543	251.333
$V_{\theta 9}$	50.755	55.015	47.635	36.993	28.510	27.900	26.980	22.502
M_8	.488	.514	.491	.474	.443	.423	.402	.369
M_9	.350	.385	.401	.390	.370	.361	.337	.278
$\Delta\beta$	37.279	35.159	35.254	35.582	33.349	32.108	31.589	33.435
$\bar{\omega}$	.220	.107	.048	.047	.051	.048	.096	.236
$\bar{\omega}\ \cos\beta_9/2\sigma$	.057	.028	.013	.014	.016	.016	.033	.084
D	.428	.393	.333	.338	.333	.317	.340	.439
η_p	.570	.775	.869	.864	.840	.832	.689	.470
i_m	1.273	.397	1.991	2.308	1.731	2.014	2.258	4.039
i_s	-[illegible].287	-4.363	-3.389	-3.662	-5.129	-5.716	-5.882	-4.021
$\delta°$	18.13[illegible]	1[illegible].958	16.238	14.906	13.942	14.536	15.810	16.333

PERCENT DESIGN SPEED, $\frac{N/\sqrt{\theta}}{N/\sqrt{\theta}\ \text{DESIGN}} \times 100$ = 49.9454

CORRECTED ROTOR SPEED, $N/\sqrt{\theta}$ = 4430.760

CORRECTED WEIGHT FLOW, $W\sqrt{\theta}/\delta$ = 71.980

CORRECTED FLOW PER UNIT FRONTAL AREA, $\frac{W\sqrt{\theta}/\delta}{A_f}$ = 13.9248

CORRECTED FLOW PER UNIT ANNULUS AREA, $\frac{W\sqrt{\theta}/\delta}{A_{an}}$ = 19.4096

TABLE 1-2

BLADE ELEMENT PERFORMANCE, MCA STATOR B
50% DESIGN SPEED, POINT 2

STATOR

% SPAN	95	90	80	70	50	30	10	05
Dia.	22.300	22.680	23.670	24.480	26.350	28.190	30.000	30.540
β_8	46.934	44.668	43.494	42.707	40.057	38.332	38.814	40.930
β_9	8.067	7.145	5.709	4.579	3.599	3.737	4.680	4.695
V_8	537.792	564.155	541.241	522.524	482.837	464.432	441.106	406.195
V_9	372.813	408.183	425.666	415.833	389.398	380.002	356.197	294.531
V_{Z8}	366.539	400.527	392.108	383.557	369.377	364.257	343.697	306.883
V_{Z9}	368.183	404.060	422.762	413.877	388.328	379.086	354.989	293.534
$V_{\theta 8}$	392.890	396.597	372.522	354.399	310.730	288.048	276.485	266.115
$V_{\theta 9}$	52.316	50.770	42.341	33.199	24.442	24.764	29.065	24.109
M_8	.484	.509	.488	.470	.433	.416	.394	.362
M_9	.332	.364	.380	.371	.347	.339	.317	.261
$\Delta\beta$	38.867	37.523	37.785	38.127	36.458	34.595	34.134	36.235
$\bar{\omega}$	.201	.097	.050	.044	.038	.052	.088	.211
$\bar{\omega}\ \cos\beta_9/2\sigma$	.052	.025	.014	.013	.012	.017	.031	.074
D	.467	.435	.378	.382	.380	.366	.387	.486
η_p	.641	.816	.881	.892	.900	.849	.760	.574
i_m	3.494	2.558	4.124	4.567	4.487	4.272	5.384	7.400
i_s	-1.066	-2.202	-1.256	-1.403	-2.373	-3.458	-2.756	-.660
$\delta°$	18.967	17.755	15.839	14.619	13.589	14.307	16.390	16.895

PERCENT DESIGN SPEED, $\frac{N/\sqrt{\theta}}{N/\sqrt{\theta}\ \text{DESIGN}} \times 100$ = 49.9789

CORRECTED ROTOR SPEED, $N/\sqrt{\theta}$ = 4433.130

CORRECTED WEIGHT FLOW, $W\sqrt{\theta}/\delta$ = 69.760

CORRECTED FLOW PER UNIT FRONTAL AREA, $\frac{W\sqrt{\theta}/\delta}{A_f}$ = 13.3104

CORRECTED FLOW PER UNIT ANNULUS AREA, $\frac{W\sqrt{\theta}/\delta}{A_{an}}$ = 18.5532

TABLE 1-3

BLADE ELEMENT PERFORMANCE, MCA STATOR B
50% DESIGN SPEED, POINT 3

STATOR

% SPAN	95	90	80	70	50	30	10	05
Dia.	22.300	22.680	23.670	24.480	26.350	28.190	30.000	30.540
β_8	46.733	44.670	44.520	44.762	41.299	40.070	42.086	44.399
β_9	7.858	7.988	5.684	5.723	4.548	4.378	4.787	4.800
V_8	525.378	549.651	531.847	515.889	471.460	451.071	424.064	391.229
V_9	354.950	389.749	408.274	401.236	369.800	358.789	333.680	276.265
V_{Z8}	359.459	390.262	378.740	365.946	354.042	345.145	314.711	279.526
V_{Z9}	350.780	385.123	405.569	398.686	368.383	357.655	332.501	275.290
$V_{\theta 8}$	382.566	386.417	372.906	363.273	311.161	290.363	284.228	273.724
$V_{\theta 9}$	48.527	54.161	40.436	40.011	29.320	27.390	27.847	23.119
M_8	.473	.496	.478	.463	.423	.404	.378	.348
M_9	.316	.347	.364	.357	.329	.319	.296	.244
$\Delta\beta$	38.875	36.682	38.836	39.039	36.752	35.692	37.299	39.599
$\bar{\omega}$	.202	.103	.067	.060	.058	.065	.081	.208
$\bar{\omega}\ \cos\beta_9/2\sigma$	.052	.027	.018	.017	.018	.021	.028	.074
D	.485	.447	.401	.403	.404	.394	.423	.521
η_p	.655	.807	.847	.860	.861	.827	.798	.600
i_m	3.293	2.560	5.150	6.622	5.729	6.010	8.656	10.869
i_s	-1.267	-2.200	-.230	.652	-1.131	-1.720	.516	2.809
$\delta°$	18.758	18.598	15.814	15.763	14.538	14.948	16.497	17.000

PERCENT DESIGN SPEED, $\frac{N/\sqrt{\theta}}{N/\sqrt{\theta}\ \text{DESIGN}} \times 100 = 49.9794$

CORRECTED ROTOR SPEED, $N/\sqrt{\theta} = 4433.170$

CORRECTED WEIGHT FLOW, $W\sqrt{\theta}/\delta = 66.660$

CORRECTED FLOW PER UNIT FRONTAL AREA, $\frac{W\sqrt{\theta}/\delta}{A_f} = 12.7189$

CORRECTED FLOW PER UNIT ANNULUS AREA, $\frac{W\sqrt{\theta}/\delta}{A_{an}} = 17.7287$

TABLE 1-4

BLADE ELEMENT PERFORMANCE, MCA STATOR B
50% DESIGN SPEED, POINT 4

STATOR

% SPAN	95	90	80	70	50	30	10	05
Dia.	22.300	22.680	23.670	24.480	26.350	28.190	30.000	30.540
β_8	48.824	46.513	46.268	46.243	42.938	42.516	46.826	50.187
β_9	7.693	7.85[illegible]	6.053	5.964	4.739	4.425	4.452	4.49[illegible]
V_8	522.104	545.576	528.908	516.640	469.042	445.715	413.012	377.702
V_9	343.020	375.444	394.272	390.007	353.597	338.697	306.625	254.586
V_{Z8}	343.192	374.919	365.098	357.02[illegible]	343.270	328.508	282.589	241.838
V_{Z9}	339.198	371.197	391.482	387.4[illegible]	352.192	337.625	305.690	253.798
$V_{\theta 8}$	392.985	395.833	382.308	373.157	319.517	301.212	301.202	290.126
$V_{\theta 9}$	45.920	51.258	41.573	40.660	29.212	26.134	23.802	19.964
M_8	.469	.491	.475	.463	.420	.398	.367	.335
M_9	.304	.334	.351	.347	[illegible]	.301	.271	.225
$\Delta\beta$	41.131	38.666	40.235	40.259	38.1[illegible]9	38.091	42.374	45.689
$\bar{\omega}$	.200	.111	.077	.079	.088	.096	.110	.214
$\bar{\omega}\ \cos\beta_9/2\sigma$	.051	.029	.021	.023	.028	.031	.038	.076
D	.511	.475	.428	.431	.441	.441	.491	.579
η_p	.671	.804	.837	.830	.811	.762	.769	.621
i_m	5.384	4.403	6.918	8.103	7.368	8.456	13.396	16.657
i_s	.824	-.3[illegible]7	1.538	2.133	.508	.726	5.256	8.597
$\delta°$	18.593	18.457	16.183	16.024	14.729	14.995	16.162	16.698

PERCENT DESIGN SPEED $\frac{N/\sqrt{\theta}}{N/\sqrt{\theta}\ \text{DESIGN}} \times 100 = 49.9735$

CORRECTED ROTOR SPEED, $N/\sqrt{\theta} = 4432.650$

CORRECTED WEIGHT FLOW, $W\sqrt{\theta}/\delta = 63.590$

CORRECTED FLOW PER UNIT FRONTAL AREA, $\frac{W\sqrt{\theta}/\delta}{A_f} = 12.1332$

CORRECTED FLOW PER UNIT ANNULUS AREA, $\frac{W\sqrt{\theta}/\delta}{A_{an}} = 16.9122$

TABLE 1-5

BLADE ELEMENT PERFORMANCE, MCA STATOR B
50% DESIGN SPEED, POINT 5

STATOR

% SPAN	95	90	80	70	50	30	10	05
Dia.	22.300	22.680	23.670	24.480	26.350	28.190	30.000	30.540
β_8	48.649	48.677	48.273	48.059	44.890	47.101	52.707	53.501
β_9	7.458	7.540	6.213	5.962	5.254	5.554	5.[illegible]	4.323
V_8	537.779	527.801	517.164	511.861	460.496	434.704	404.254	394.174
V_9	332.483	359.760	380.440	377.211	334.326	307.103	282.255	245.182
V_{Z8}	354.831	348.097	343.923	341.904	326.175	295.891	244.933	234.457
V_{Z9}	329.062	356.054	377.733	374.811	332.780	305.619	281.037	244.483
$V_{\theta 8}$	403.697	396.378	385.971	380.737	324.992	318.447	321.603	316.864
$V_{\theta 9}$	43.156	47.209	41.173	39.180	30.616	29.720	26.135	18.480
M_8	.484	.474	.464	.458	.412	.387	.359	.349
M_9	.295	.319	.338	.335	.296	.272	.249	.216
$\Delta\beta$	41.191	41.137	42.060	42.097	39.636	41.548	47.394	49.179
$\bar{\omega}$	.182	.121	.090	.113	.136	.175	.179	.255
$\bar{\omega}\ Cos\beta_9/2\sigma$	.047	.032	.025	.033	.043	.057	.062	.090
D	.551	.489	.444	.456	.475	.510	.556	.646
η_p	.727	.790	.819	.773	.727	.668	.669	.599
i_m	5.209	6.567	8.903	9.919	9.320	13.041	19.277	19.971
i_s	.649	1.807	3.523	3.949	2.460	5.311	11.137	11.911
$\delta°$	18.358	18.150	16.343	16.002	15.244	16.124	17.023	16.523

PERCENT DESIGN SPEED, $\frac{N/\sqrt{\theta}}{N/\sqrt{\theta}\ DESIGN} \times 100$ = 49.9681

CORRECTED ROTOR SPEED, $N/\sqrt{\theta}$ = 4432.173

CORRECTED WEIGHT FLOW, $W\sqrt{\theta}/\delta$ = 60.090

CORRECTED FLOW PER UNIT FRONTAL AREA, $\frac{W\sqrt{\theta}/\delta}{A_f}$ = 11.4654

CORRECTED FLOW PER UNIT ANNULUS AREA, $\frac{W\sqrt{\theta}/\delta}{A_{an}}$ = 15.9814

TABLE 1-6

BLADE ELEMENT PERFORMANCE, MCA STATOR B
50% DESIGN SPEED, POINT 6

STATOR

% SPAN	95	90	80	70	50	30	10	05
Dia.	22.300	22.680	23.670	24.480	26.350	28.190	30.000	30.540
β_8	49.080	49.027	48.455	46.171	46.363	50.204	57.337	59.499
β_9	5.874	6.678	5.317	6.233	6.166	6.174	2.762	-.495
V_8	526.185	517.099	509.149	503.805	452.391	414.425	398.866	385.256
V_9	323.626	354.938	376.131	369.386	316.443	272.385	262.202	227.623
V_{Z8}	344.300	338.758	337.471	335.866	312.161	265.254	215.266	195.537
V_{Z9}	321.455	352.072	373.503	366.957	314.533	270.787	261.895	227.614
$V_{\theta 8}$	397.600	390.421	381.067	375.403	327.408	318.414	335.790	331.944
$V_{\theta 9}$	33.120	41.277	41.386	40.105	33.989	29.296	12.635	-1.965
M_8	.473	.464	.456	.451	.404	.369	.353	.341
M_9	.267	.315	.334	.328	.280	.240	.231	.200
$\Delta\beta$	43.206	42.349	42.138	41.938	40.197	44.030	54.575	59.994
$\bar{\omega}$	.200	.129	.097	.140	.195	.248	.258	.348
$\bar{\omega}\ Cos\beta_9/2\sigma$	.052	.034	.026	.041	.061	.081	.090	.123
D	.560	.486	.441	.459	.505	.570	.624	.716
η_p	.700	.774	.804	.716	.640	.594	574	.481
i_m	5.640	6.917	9.085	10.031	10.793	16.144	23.907	25.969
i_s	1.080	2.157	3.705	4.061	3.933	8.414	15.767	17.909
$\delta°$	16.774	17.288	16.447	16.273	16.156	16.744	14.472	11.705

PERCENT DESIGN SPEED, $\frac{N/\sqrt{\theta}}{N/\sqrt{\theta}\ DESIGN} \times 100$ = 49.9794

CORRECTED ROTOR SPEED, = 4433.170

CORRECTED WEIGHT FLOW, $W\sqrt{\theta}/\delta$ = 56.590

CORRECTED FLOW PER UNIT FRONTAL AREA, $\frac{W\sqrt{\theta}/\delta}{A_f}$ = 10.7976

CORRECTED FLOW PER UNIT ANNULUS AREA, $\frac{W\sqrt{\theta}/\delta}{A_{an}}$ = 15.0505

TABLE 2-1

BLADE ELEMENT PERFORMANCE, MCA STATOR B
70% DESIGN SPEED, POINT 1

STATOR

% SPAN	95	90	80	70	50	30	10	05
Dia.	22.300	22.680	23.670	24.480	26.350	28.190	30.000	30.540
β_8	46.520	44.484	43.055	41.722	38.849	36.973	36.216	38.134
β_9	7.985	7.560	4.789	3.500	3.043	3.191	4.430	4.524
V_8	791.716	826.464	790.077	766.267	726.012	695.729	657.730	607.214
V_9	531.391	584.023	611.102	600.891	577.645	563.945	527.970	437.208
V_{Z8}	543.603	588.447	576.372	571.193	565.060	555.713	530.644	477.612
V_{Z9}	524.734	577.410	607.665	598.719	576.297	562.873	526.352	435.829
$V_{\theta 8}$	574.480	579.114	539.390	509.961	455.404	418.439	388.608	374.958
$V_{\theta 9}$	73.813	76.838	51.020	36.686	30.661	31.387	40.781	34.483
M_8	.719	.754	.718	.695	.656	.627	.590	.542
M_9	.470	.519	.544	.535	.514	.501	.466	.385
$\Delta\beta$	38.535	36.924	38.266	38.222	35.806	33.783	31.786	33.610
$\bar{\omega}$	.225	.114	.043	.037	.046	.056	.101	.210
$\bar{\omega}\cos\beta_9/2\sigma$	.058	.030	.012	.011	.014	.018	.035	.074
D	.489	.450	.393	.394	.389	.371	.381	.479
η_p	.648	.813	.914	.923	.896	.861	.750	.604
i_m	3.080	2.374	3.685	3.582	3.279	2.913	2.786	4.604
i_s	-1.480	-2.386	-1.695	-2.388	-3.581	-4.817	-5.354	-3.456
$\delta°$	18.885	18.170	14.919	13.540	13.033	13.761	16.140	16.724

PERCENT DESIGN SPEED, $\frac{N/\sqrt{\theta}}{N/\sqrt{\theta}\ \text{DESIGN}} \times 100 = 69.9398$

CORRECTED ROTOR SPEED, $N/\sqrt{\theta} = 6203.660$

CORRECTED WEIGHT FLOW, $w\sqrt{\theta}/\delta = 101.490$

CORRECTED FLOW PER UNIT FRONTAL AREA, $\frac{w\sqrt{\theta}/\delta}{A_f} = 19.3646$

CORRECTED FLOW PER UNIT ANNULUS AREA, $\frac{w\sqrt{\theta}/\delta}{A_{an}} = 26.9920$

TABLE 2-2

BLADE ELEMENT PERFORMANCE, MCA STATOR B
70% DESIGN SPEED, POINT 2

STATOR

% SPAN	95	90	80	70	50	30	10	05
Dia.	22.300	22.680	23.670	24.480	26.350	28.190	30.000	30.540
β_8	46.713	44.760	43.964	43.300	40.937	39.469	38.814	40.728
β_9	7.638	7.821	5.340	3.321	2.775	3.149	4.030	4.050
V_8	775.079	808.658	776.438	753.205	705.778	676.930	642.981	595.591
V_9	500.941	550.967	580.248	571.808	543.479	530.629	499.845	412.851
V_{Z8}	531.071	573.082	558.035	547.520	532.853	522.465	500.993	451.343
V_{Z9}	495.160	544.480	576.569	569.909	542.370	529.652	498.573	411.805
$V_{\theta 8}$	564.926	569.749	539.010	516.558	462.447	430.299	403.015	388.608
$V_{\theta 9}$	66.580	74.978	54.005	33.120	26.311	29.145	35.127	29.159
M_8	.704	.737	.704	.681	.635	.607	.575	.530
M_9	.442	.486	.515	.507	.481	.469	.441	.362
$\Delta\beta$	39.075	36.959	38.624	39.979	38.162	36.321	34.784	36.678
$\bar{\omega}$	.220	.117	.055	.042	.041	.052	.087	.204
$\bar{\omega}\cos\beta_9/2\sigma$	.057	.031	.015	.012	.013	.017	.030	.072
D	.517	.477	.421	.426	.425	.409	.421	.521
η_p	.674	.818	.896	.916	.913	.883	.806	.641
i_m	3.273	2.670	4.594	5.160	5.367	5.409	5.384	7.198
i_s	-1.287	-2.090	-.786	-.810	-1.493	-2.321	-2.756	-.862
$\delta°$	18.538	18.431	15.470	13.361	12.765	13.719	15.740	16.250

PERCENT DESIGN SPEED, $\frac{N/\sqrt{\theta}}{N/\sqrt{\theta}\ \text{DESIGN}} \times 100 = 70.0817$

CORRECTED ROTOR SPEED, $N/\sqrt{\theta} = 6216.250$

CORRECTED WEIGHT FLOW, $w\sqrt{\theta}/\delta = 97.880$

CORRECTED FLOW PER UNIT FRONTAL AREA, $\frac{w\sqrt{\theta}/\delta}{A_f} = 18.6758$

CORRECTED FLOW PER UNIT ANNULUS AREA, $\frac{w\sqrt{\theta}/\delta}{A_{an}} = 26.0319$

TABLE 2-3

BLADE ELEMENT PERFORMANCE, MCA STATOR B
70% DESIGN SPEED, POINT 3

STATOR

% SPAN	95	90	80	70	50	30	10	05
Dia.	22.300	22.680	23.670	24.480	26.350	28.190	30.000	30.540
β_1	47.931	45.800	45.126	44.591	41.883	40.978	44.053	46.786
β_2	7.350	7.759	4.963	3.526	2.629	3.225	3.579	3.587
V_1	755.904	790.546	761.946	741.409	693.652	657.219	624.825	575.257
V_2	475.212	523.931	554.063	546.878	512.590	498.182	467.414	385.051
V_{Z1}	505.547	550.215	536.893	527.455	516.198	496.115	449.056	393.894
V_{Z2}	470.154	517.966	551.008	545.067	511.686	497.265	466.478	384.286
$V_{\theta 1}$	561.139	566.752	539.962	520.501	463.093	430.981	434.456	419.246
$V_{\theta 2}$	60.791	70.738	47.932	33.630	23.510	28.027	29.176	24.091
M_1	.683	.718	.689	.669	.623	.588	.555	.508
M_2	.418	.463	.490	.483	.452	.439	.409	.335
$\Delta\beta$	40.582	38.041	40.163	41.066	39.255	37.753	40.474	43.199
$\bar{\omega}$	.213	.119	.061	.059	.077	.061	.084	.190
$\bar{\omega}\cos\beta_2/2\sigma$	.055	.031	.017	.017	.024	.020	.029	.067
D	.539	.499	.447	.452	.461	.442	.477	.574
η_p	.694	.821	.890	.889	.853	.867	.830	.684
i_m	4.491	3.690	5.756	6.451	6.313	6.918	10.623	13.256
i_s	-.069	-1.070	.376	.481	-.547	-.812	2.483	5.196
$\delta°$	18.250	18.369	15.093	13.566	12.619	13.795	15.289	15.787

PERCENT DESIGN SPEED, $\frac{N/\sqrt{\theta}}{N/\sqrt{\theta}\ \text{DESIGN}} \times 100 = 70.0004$

CORRECTED ROTOR SPEED, $N/\sqrt{\theta} = 6209.040$

CORRECTED WEIGHT FLOW, $W\sqrt{\theta}/\delta = 93.880$

CORRECTED FLOW PER UNIT FRONTAL AREA, $\frac{W\sqrt{\theta}/\delta}{A_f} = 17.9126$

CORRECTED FLOW PER UNIT ANNULUS AREA, $\frac{W\sqrt{\theta}/\delta}{A_{an}} = 24.9681$

TABLE 2-4

BLADE ELEMENT PERFORMANCE, MCA STATOR B
70% DESIGN SPEED, POINT 4

STATOR

% SPAN	95	90	80	70	50	30	10	05
Dia.	22.300	22.680	23.670	24.480	26.350	28.190	30.000	30.540
β_1	49.436	47.184	46.520	46.197	44.113	43.392	46.122	48.873
β_2	7.807	8.550	6.016	4.916	2.710	3.663	3.924	3.931
V_1	746.569	779.346	755.689	736.610	675.085	642.227	601.756	555.418
V_2	454.839	502.556	533.877	529.385	486.201	465.977	429.956	357.497
V_{Z1}	484.682	528.672	519.376	509.409	484.497	466.640	417.089	365.316
V_{Z2}	449.593	495.928	530.066	526.747	485.343	464.918	428.928	356.648
$V_{\theta 1}$	567.152	571.680	548.342	531.627	469.911	441.198	433.757	418.369
$V_{\theta 2}$	61.782	74.717	55.955	45.362	22.991	29.774	29.424	24.509
M_1	.673	.706	.682	.662	.604	.572	.533	.490
M_2	.399	.442	.471	.466	.428	.409	.375	.311
$\Delta\beta$	41.629	38.634	40.504	41.281	41.403	39.728	42.198	44.942
$\bar{\omega}$	.215	.120	.078	.075	.072	.090	.104	.199
$\bar{\omega}\cos\beta_2/2\sigma$	.055	.031	.021	.022	.023	.030	.036	.070
D	.562	.520	.469	.472	.488	.483	.519	.607
η_p	.701	.825	.867	.868	.869	.826	.808	.685
i_m	5.996	5.074	7.150	8.057	8.543	9.332	12.692	15.343
i_s	1.436	.314	1.770	2.087	1.683	1.602	4.552	7.283
$\delta°$	18.707	19.160	16.146	14.956	12.700	14.233	15.634	16.131

PERCENT DESIGN SPEED, $\frac{N/\sqrt{\theta}}{N/\sqrt{\theta}\ \text{DESIGN}} \times 100 = 69.9678$

CORRECTED ROTOR SPEED, $N/\sqrt{\theta} = 6206.140$

CORRECTED WEIGHT FLOW, $W\sqrt{\theta}/\delta = 89.330$

CORRECTED FLOW PER UNIT FRONTAL AREA, $\frac{W\sqrt{\theta}/\delta}{A_f} = 17.1399$

CORRECTED FLOW PER UNIT ANNULUS AREA, $\frac{W\sqrt{\theta}/\delta}{A_{an}} = 23.8910$

TABLE 2-5

BLADE ELEMENT PERFORMANCE, MCA STATOR B
70% DESIGN SPEED, POINT 5

STATOR

% SPAN	95	90	80	70	50	30	10	05
Dia.	22.300	22.680	23.670	24.480	26.350	28.190	30.000	30.540
β_8	50.556	48.404	48.338	48.298	46.357	45.824	51.421	55.287
β_9	7.487	8.195	6.874	5.787	3.499	5.195	4.376	1.856
V_8	744.568	773.907	752.722	740.017	673.384	636.582	596.830	548.498
V_9	437.137	465.885	517.431	515.498	464.469	433.561	398.964	331.694
V_{Z8}	472.327	513.073	499.858	491.935	464.608	443.585	372.182	312.353
V_{Z9}	432.521	478.048	512.982	512.303	463.367	431.709	397.789	331.516
$V_{\theta 8}$	574.990	578.763	562.339	552.504	487.299	456.559	466.568	450.872
$V_{\theta 9}$	56.959	68.973	61.929	51.975	28.348	39.253	30.445	10.740
M_8	.670	.699	.677	.664	.601	.565	.525	.481
M_9	.382	.425	.455	.452	.407	.379	.346	.287
$\Delta\beta$	43.069	40.209	41.463	42.511	42.858	40.630	47.044	53.431
$\bar{\omega}$	.221	.129	.088	.097	.107	.146	.149	.245
$\bar{\omega}\ \mathrm{Cos}\,\beta_9/2\sigma$	.057	.034	.024	.028	.034	.048	.052	.087
D	.589	.545	.492	.499	.525	.532	.586	.679
η_p	.705	.818	.856	.838	.820	.753	.757	.639
i_m	7.116	6.294	8.968	10.158	10.787	11.764	17.991	21.757
i_s	2.556	1.534	3.588	4.188	3.927	4.034	9.851	13.697
$\delta°$	18.387	18.805	17.004	15.827	13.489	15.765	16.086	14.056

PERCENT DESIGN SPEED, $\dfrac{N/\sqrt{\theta}}{N/\sqrt{\theta}\ \text{DESIGN}} \times 100 = 69.9278$

CORRECTED ROTOR SPEED, $N/\sqrt{\theta} = 6202.600$

CORRECTED WEIGHT FLOW, $W\sqrt{\theta}/\delta = 85.590$

CORRECTED FLOW PER UNIT FRONTAL AREA, $\dfrac{W\sqrt{\theta}/\delta}{A_f} = 16.3309$

CORRECTED FLOW PER UNIT ANNULUS AREA, $\dfrac{W\sqrt{\theta}/\delta}{A_{an}} = 22.7633$

TABLE 2-6

BLADE ELEMENT PERFORMANCE, MCA STATOR B
70% DESIGN SPEED, POINT 6

STATOR

% SPAN	95	90	80	70	50	30	10	05
Dia.	22.300	22.680	23.670	24.480	26.350	28.190	30.000	30.540
β_8	52.060	49.474	48.934	48.526	47.325	48.763	54.889	59.885
β_9	6.998	7.648	7.615	7.466	6.645	6.625	4.165	1.072
V_8	722.163	753.276	736.297	727.232	658.342	609.924	585.037	534.809
V_9	422.739	482.513	515.335	510.484	444.011	396.129	373.080	314.478
V_{Z8}	443.441	488.913	483.314	481.365	446.169	402.036	336.493	268.332
V_{Z9}	416.846	477.460	510.191	505.707	440.863	393.440	372.089	314.420
$V_{\theta 8}$	569.541	572.577	555.130	544.882	484.022	458.657	478.582	462.622
$V_{\theta 9}$	51.507	64.215	68.293	66.335	51.379	45.699	27.094	5.882
M_8	.646	.679	.661	.651	.586	.540	.513	.467
M_9	.369	.423	.453	.448	.388	.345	.322	.271
$\Delta\beta$	45.062	41.827	41.318	41.059	40.680	42.138	50.724	58.813
$\bar{\omega}$	.257	.126	.099	.123	.169	.206	.229	.320
$\bar{\omega}\ \mathrm{Cos}\,\beta_9/2\sigma$	.066	.033	.027	.036	.053	.067	.079	.113
D	.596	.534	.478	.488	.532	.571	.631	.714
η_p	.653	.813	.832	.791	.723	.675	.651	.539
i_m	8.620	7.364	9.564	10.386	11.755	14.703	21.459	26.355
i_s	4.060	2.604	4.164	4.416	4.895	6.973	13.319	18.295
$\delta°$	17.898	18.258	17.745	17.506	16.635	17.195	15.875	13.272

PERCENT DESIGN SPEED, $\dfrac{N/\sqrt{\theta}}{N/\sqrt{\theta}\ \text{DESIGN}} \times 100 = 69.9434$

CORRECTED ROTOR SPEED, $N/\sqrt{\theta} = 6203.980$

CORRECTED WEIGHT FLOW, $W\sqrt{\theta}/\delta = 81.540$

CORRECTED FLOW PER UNIT FRONTAL AREA, $\dfrac{W\sqrt{\theta}/\delta}{A_f} = 15.5581$

CORRECTED FLOW PER UNIT ANNULUS AREA, $\dfrac{W\sqrt{\theta}/\delta}{A_{an}} = 21.6862$

TABLE 3-1

BLADE ELEMENT PERFORMANCE, MCA STATOR B
90% DESIGN SPEED, POINT 1

STATOR

% SPAN	95	90	80	70	50	30	10	05
Dia.	22.300	22.680	23.670	24.480	26.350	28.190	30.000	30.540
β_8	44.658	43.149	42.500	41.744	39.423	37.462	36.607	38.401
β_9	8.210	7.978	6.156	5.004	3.960	4.280	5.735	5.745
V_8	1000.405	1038.880	1001.480	980.104	935.657	901.249	866.232	803.546
V_9	616.287	689.283	739.315	742.891	719.701	709.041	678.020	564.520
V_{Z8}	710.105	756.439	737.165	730.314	722.267	715.187	695.343	629.721
V_{Z9}	608.221	680.785	733.443	738.714	717.263	706.774	674.557	561.654
$V_{\theta 8}$	703.153	710.489	676.593	652.555	594.182	548.173	516.551	499.127
$V_{\theta 9}$	88.011	95.668	79.277	64.800	49.700	52.918	67.752	56.508
M_8	.920	.962	.920	.897	.850	.815	.779	.717
M_9	.539	.607	.655	.658	.636	.626	.596	.491
$\Delta\beta$	36.447	35.171	36.345	36.740	35.463	33.182	30.872	32.656
$\bar{\omega}$	.315	.195	.100	.065	.065	.071	.126	.228
$\bar{\omega}$ Cos $\beta_9/2\sigma$	.081	.051	.027	.019	.020	.023	.044	.080
D	.539	.489	.423	.415	.414	.392	.397	.492
η_p	.593	.735	.834	.884	.878	.852	.735	.615
i_m	1.218	1.039	3.130	3.604	3.853	3.402	3.177	4.871
i_s	-3.342	-3.721	-2.250	-2.366	-3.007	-4.326	-4.963	-3.189
$\delta°$	19.110	18.588	16.286	15.044	13.950	14.850	17.445	17.945

PERCENT DESIGN SPEED, $\frac{N/\sqrt{\theta}}{N/\sqrt{\theta}\ \text{DESIGN}} \times 100 = 90.0100$

CORRECTED ROTOR SPEED, $N/\sqrt{\theta} = 7983.890$

CORRECTED WEIGHT FLOW, $W\sqrt{\theta}/\delta = 126.540$

CORRECTED FLOW PER UNIT FRONTAL AREA, $\frac{W\sqrt{\theta}/\delta}{A_f} = 24.1442$

CORRECTED FLOW PER UNIT ANNULUS AREA, $\frac{W\sqrt{\theta}/\delta}{A_{an}} = 33.6543$

TABLE 3-2

BLADE ELEMENT PERFORMANCE, MCA STATOR B
90% DESIGN SPEED, POINT 2

STATOR

% SPAN	95	90	80	70	50	30	10	05
Dia.	22.300	22.680	23.670	24.480	26.350	28.190	30.000	30.540
β_8	46.277	44.420	43.656	42.801	40.293	38.340	37.926	39.578
β_9	8.444	8.289	5.356	3.809	2.491	3.013	4.785	4.876
V_8	999.077	1043.757	1006.553	984.833	936.265	901.519	861.166	803.101
V_9	597.595	666.319	709.425	713.497	689.464	677.491	648.922	536.992
V_{Z8}	689.026	743.947	727.023	721.606	713.636	706.926	679.273	618.989
V_{Z9}	589.395	657.568	704.762	710.614	688.120	676.281	646.596	535.020
$V_{\theta 8}$	722.023	730.545	694.647	669.150	605.473	559.236	529.310	511.681
$V_{\theta 9}$	87.756	96.064	66.222	47.396	29.965	35.607	54.126	45.645
M_8	.916	.964	.923	.899	.849	.814	.772	.715
M_9	.520	.584	.624	.623	.606	.595	.567	.465
$\Delta\beta$	37.833	36.131	38.300	38.992	37.802	35.327	33.141	34.702
$\bar{\omega}$	.260	.151	.081	.050	.053	.071	.100	.205
$\bar{\omega}$ Cos $\beta_9/2\sigma$	.067	.040	.022	.015	.017	.023	.035	.072
D	.562	.518	.464	.458	.457	.438	.438	.537
η_p	.679	.807	.879	.920	.911	.869	.811	.683
i_m	2.837	2.310	4.286	4.661	4.723	4.280	4.496	6.048
i_s	-1.723	-2.450	-1.094	-1.309	-2.137	-3.450	-3.644	-2.012
$\delta°$	19.344	18.899	15.486	13.849	12.481	13.583	16.495	17.076

PERCENT DESIGN SPEED, $\frac{N/\sqrt{\theta}}{N/\sqrt{\theta}\ \text{DESIGN}} \times 100 = 90.0070$

CORRECTED ROTOR SPEED, $N/\sqrt{\theta} = 7983.620$

CORRECTED WEIGHT FLOW, $W\sqrt{\theta}/\delta = 125.170$

CORRECTED FLOW PER UNIT FRONTAL AREA, $\frac{W\sqrt{\theta}/\delta}{A_f} = 23.8828$

CORRECTED FLOW PER UNIT ANNULUS AREA, $\frac{W\sqrt{\theta}/\delta}{A_{an}} = 33.2899$

TABLE 3-3

BLADE ELEMENT PERFORMANCE, MCA STATOR B
90% DESIGN SPEED, POINT 3

STATOR

% SPAN	95	90	80	70	50	30	10	05
Dia.	22.300	22.680	23.670	24.480	26.350	28.190	30.000	30.540
β_8	49.285	47.106	46.584	46.108	43.766	42.194	42.189	43.613
β_9	6.915	7.487	4.239	2.749	2.137	2.655	2.952	2.765
V_8	974.943	1021.537	987.890	965.027	903.623	874.754	840.799	793.110
V_9	549.731	603.346	646.864	650.638	621.275	619.699	600.804	492.337
V_{Z8}	634.550	693.861	677.811	668.128	652.095	647.918	622.953	574.220
V_{Z9}	535.224	596.566	643.652	648.683	620.210	618.760	599.947	491.738
$V_{\theta 8}$	738.974	748.397	717.591	695.446	625.052	587.520	564.667	547.073
$V_{\theta 9}$	65.105	78.621	47.815	31.207	23.166	28.702	30.939	23.754
M_8	.886	.936	.898	.873	.812	.782	.746	.699
M_9	.467	.524	.563	.566	.540	.537	.519	.422
$\Delta\beta$	42.370	39.619	42.345	43.359	41.629	39.539	39.238	40.847
$\bar{\omega}$	.226	.136	.085	.063	.056	.070	.095	.194
$\bar{\omega}\ \cos\beta_9/2\sigma$	.058	.036	.023	.018	.018	.023	.033	.069
D	.620	.579	.529	.525	.522	.500	.506	.613
η_p	.737	.839	.885	.911	.916	.881	.839	.728
i_m	5.845	4.996	7.214	7.968	8.196	8.134	8.759	10.083
i_s	1.285	.236	1.834	1.998	1.336	.404	.619	2.023
$\delta°$	17.815	18.097	14.369	12.789	12.127	13.225	14.662	14.965

PERCENT DESIGN SPEED, $\frac{N/\sqrt{\theta}}{N/\sqrt{\theta}\ \text{DESIGN}} \times 100 = 89.9148$

CORRECTED ROTOR SPEED, $N/\sqrt{\theta} = 7975.440$

CORRECTED WEIGHT FLOW, $W\sqrt{\theta}/\delta = 119.370$

CORRECTED FLOW PER UNIT FRONTAL AREA, $\frac{W\sqrt{\theta}/\delta}{A_f} = 22.7762$

CORRECTED FLOW PER UNIT ANNULUS AREA, $\frac{W\sqrt{\theta}/\delta}{A_{an}} = 31.7473$

TABLE 3-4

BLADE ELEMENT PERFORMANCE, MCA STATOR B
90% DESIGN SPEED, POINT 4

STATOR

% SPAN	95	90	80	70	50	30	10	05
Dia.	22.300	22.680	23.670	24.480	26.350	28.190	30.000	30.540
β_8	50.866	48.645	48.548	48.266	45.030	44.456	46.325	47.444
β_9	7.485	8.274	5.566	4.149	2.696	2.702	2.699	2.703
V_8	970.712	1014.835	983.476	963.612	898.062	857.237	824.341	784.017
V_9	511.683	574.241	623.750	628.257	593.918	578.239	559.375	470.698
V_{Z8}	611.402	669.240	650.057	640.663	634.309	611.765	569.251	530.236
V_{Z9}	505.939	566.826	619.540	625.559	592.730	577.395	558.709	470.155
$V_{\theta 8}$	752.949	761.768	737.124	719.092	635.360	600.374	596.220	577.520
$V_{\theta 9}$	66.657	82.640	60.503	45.451	27.935	27.257	26.343	22.197
M_8	.879	.925	.890	.868	.804	.762	.725	.686
M_9	.439	.496	.540	.543	.513	.498	.479	.400
$\Delta\beta$	43.380	40.371	42.981	44.118	42.334	41.754	43.626	44.741
$\bar{\omega}$	.238	.151	.092	.084	.087	.095	.113	.214
$\bar{\omega}\ \cos\beta_9/2\sigma$	.061	.040	.025	.025	.028	.031	.039	.076
D	.652	.607	.552	.550	.552	.543	.562	.650
η_p	.733	.826	.879	.865	.874	.847	.825	.709
i_m	7.426	6.535	9.178	10.126	9.460	10.396	12.895	13.914
i_s	2.866	1.775	3.798	4.156	2.600	2.666	4.755	5.854
$\delta°$	18.385	18.884	15.696	14.189	12.686	13.272	14.409	14.903

PERCENT DESIGN SPEED, $\frac{N/\sqrt{\theta}}{N/\sqrt{\theta}\ \text{DESIGN}} \times 100 = 89.8153$

CORRECTED ROTOR SPEED, $N/\sqrt{\theta} = 7966.620$

CORRECTED WEIGHT FLOW, $W\sqrt{\theta}/\delta = 114.850$

CORRECTED FLOW PER UNIT FRONTAL AREA, $\frac{W\sqrt{\theta}/\delta}{A_f} = 21.9138$

CORRECTED FLOW PER UNIT ANNULUS AREA, $\frac{W\sqrt{\theta}/\delta}{A_{an}} = 30.5452$

TABLE 3-5

BLADE ELEMENT PERFORMANCE, MCA STATOR B
90% DESIGN SPEED, POINT 5

STATOR

% SPAN	95	90	80	70	50	30	10	05
Dia.	22.300	22.680	23.670	24.480	26.350	28.190	30.000	30.540
β_8	50.456	48.351	48.359	48.238	45.656	45.720	48.785	50.487
β_9	6.963	7.611	5.877	10.243	3.512	3.596	3.914	4.014
V_8	956.866	997.463	968.153	949.850	883.897	838.256	797.008	752.252
V_9	513.497	575.574	622.726	631.730	586.647	562.106	531.229	446.838
V_{Z8}	608.096	661.762	642.451	631.984	617.519	585.157	525.133	478.622
V_{Z9}	508.444	569.197	618.326	620.744	585.100	560.839	529.958	445.728
$V_{\theta 8}$	737.870	745.329	723.520	708.509	632.127	600.138	599.542	580.347
$V_{\theta 9}$	62.253	76.229	63.765	112.341	35.932	35.251	36.259	31.282
M_8	.866	.906	.875	.854	.789	.742	.698	.655
M_9	.442	.497	.539	.546	.506	.483	.453	.379
$\Delta\beta$	43.492	40.740	42.482	37.994	42.145	42.125	44.871	46.473
$\bar{\omega}$	.241	.146	.096	.098	.104	.122	.132	.239
$\bar{\omega}\ \mathrm{Cos}\,\beta_9/2\sigma$	.062	.038	.026	.028	.033	.040	.046	.085
D	.642	.596	.541	.516	.549	.549	.579	.664
η_p	.724	.828	.871	.862	.848	.807	.798	.674
i_m	7.016	6.241	8.989	10.098	10.086	11.660	15.355	16.957
i_s	2.456	1.481	3.609	4.128	3.226	3.930	7.215	8.897
$\delta°$	17.863	18.221	16.007	20.283	13.502	14.166	15.624	16.214

PERCENT DESIGN SPEED, $\frac{N/\sqrt{\theta}}{N/\sqrt{\theta}\ \mathrm{DESIGN}} \times 100 = 69.8048$

CORRECTED ROTOR SPEED, $N/\sqrt{\theta} = 7965.690$

CORRECTED WEIGHT FLOW, $W\sqrt{\theta}/\delta = 112.650$

CORRECTED FLOW PER UNIT FRONTAL AREA, $\frac{W\sqrt{\theta}/\delta}{A_f} = 21.4940$

CORRECTED FLOW PER UNIT ANNULUS AREA, $\frac{W\sqrt{\theta}/\delta}{A_{an}} = 29.9601$

TABLE 3-6

BLADE ELEMENT PERFORMANCE, MCA STATOR B
90% DESIGN SPEED, POINT 6

STATOR

% SPAN	95	90	80	70	50	30	10	05
Dia.	22.300	22.680	23.670	24.480	26.350	28.190	30.000	30.540
β_8	52.421	49.932	49.543	48.907	46.352	46.991	51.332	54.068
β_9	6.442	7.377	5.183	4.341	3.249	3.546	2.039	1.749
V_8	943.408	986.388	958.584	943.676	875.116	827.950	776.927	724.411
V_9	499.679	560.702	607.719	614.172	569.315	535.024	496.481	420.192
V_{Z8}	574.303	633.888	621.222	619.671	603.785	564.695	485.428	425.100
V_{Z9}	495.343	554.848	604.204	611.578	568.019	533.871	496.143	419.986
$V_{\theta 8}$	[illegible]47.667	754.864	729.378	711.193	633.226	605.434	606.607	586.567
$V_{\theta 9}$	[illegible].059	71.994	54.896	46.492	32.271	33.095	17.660	12.828
M_8	.850	.894	.864	.847	.780	.731	.677	.628
M_9	.428	.483	.525	.530	.490	.458	.422	.355
$\Delta\beta$	45.980	42.555	44.360	44.565	43.102	43.444	49.293	52.319
$\bar{\omega}$	.257	.162	.118	.121	.134	.163	.163	.239
$\bar{\omega}\ \mathrm{Cos}\,\beta_9/2\sigma$	.066	.043	.032	.035	.043	.053	.057	.085
D	.656	.610	.556	.553	.566	.579	.624	.700
η_p	.705	.810	.843	.833	.808	.759	.762	.678
i_m	8.981	7.822	10.173	10.767	10.782	12.931	17.902	20.538
i_s	4.421	3.062	4.[illegible]93	4.797	3.922	5.201	9.762	12.478
$\delta°$	17.342	17.987	15.313	14.381	13.239	14.116	13.749	13.949

PERCENT DESIGN SPEED, $\frac{N/\sqrt{\theta}}{N/\sqrt{\theta}\ \mathrm{DESIGN}} \times 100 = 89.9239$

CORRECTED ROTOR SPEED, $N/\sqrt{\theta} = 976.250$

CORRECTED WEIGHT FLOW, $W\sqrt{\theta}/\delta = 109.600$

CORRECTED FLOW PER UNIT FRONTAL AREA, $\frac{W\sqrt{\theta}/\delta}{A_f} = 20.9502$

CORRECTED FLOW PER UNIT ANNULUS AREA, $\frac{W\sqrt{\theta}/\delta}{A_{an}} = 29.2021$

TABLE 3-7

BLADE ELEMENT PERFORMANCE, MCA STATOR B
90% DESIGN SPEED, POINT 7

STATOR

% SPAN	95	90	80	70	50	30	10	05
Dia.	22.300	22.680	23.670	24.480	26.350	28.190	30.000	30.540
β_8	52.094	49.672	49.423	49.059	47.186	48.194	53.134	56.609
β_9	6.289	7.253	5.290	4.373	3.241	3.608	2.060	1.736
V_8	936.491	977.322	951.457	937.545	869.696	817.059	766.179	709.427
V_9	504.054	567.088	608.622	610.248	557.591	516.612	475.827	399.685
V_{Z8}	574.423	631.566	618.220	613.852	590.870	544.623	459.663	390.433
V_{Z9}	499.944	561.447	605.117	607.750	556.386	515.489	475.502	399.495
$V_{\theta 8}$	738.914	745.061	722.660	708.210	637.981	609.839	612.976	592.324
$V_{\theta 9}$	55.213	71.592	56.110	46.531	31.525	32.510	17.104	12.105
M_8	.843	.886	.857	.840	.773	.720	.666	.613
M_9	.433	.489	.526	.526	.479	.441	.403	.337
$\Delta\beta$	45.806	42.419	44.133	44.686	43.945	44.586	51.074	54.873
$\bar{\omega}$	.250	.149	.116	.127	.157	.186	.190	.263
$\bar{\omega}\ \text{Cos}\,\beta_9/2\sigma$	.064	.039	.032	.037	.050	.061	.066	.093
D	.647	.598	.550	.553	.579	.598	.649	.726
η_p	.711	.821	.843	.825	.779	.733	.731	.653
i_m	6.654	7.562	10.053	10.919	11.616	14.134	19.704	23.079
i_s	4.094	2.802	4.673	4.949	4.756	6.404	11.5[illegible]	15.019
$\delta°$	17.189	17.863	15.420	14.413	13.231	14.178	13.770	13.936

PERCENT DESIGN SPEED, $\dfrac{N/\sqrt{\theta}}{N/\sqrt{\theta}\ \text{DESIGN}} \times 100 = 89.8445$

CORRECTED ROTOR SPEED, $N/\sqrt{\theta} = 7969.210$

CORRECTED WEIGHT FLOW, $W\sqrt{\theta}/\delta = 108.020$

CORRECTED FLOW PER UNIT FRONTAL AREA, $\dfrac{W\sqrt{\theta}/\delta}{A_f} = 20.6106$

CORRECTED FLOW PER UNIT ANNULUS AREA, $\dfrac{W\sqrt{\theta}/\delta}{A_{an}} = 28.7287$

TABLE 4-1

BLADE ELEMENT PERFORMANCE, MCA STATOR B
100% DESIGN SPEED, POINT 1

STATOR

% SPAN	95	90	80	70	50	30	10	05
Dia.	22.300	22.680	23.670	24.480	26.350	28.190	30.000	30.540
β_8	46.386	44.346	43.283	42.238	39.319	38.163	38.950	40.741
β_9	6.677	7.089	4.869	4.555	4.729	5.496	4.379	4.523
V_8	1072.527	1127.864	1089.231	1065.897	1020.794	989.403	959.977	894.441
V_9	651.238	737.186	780.746	779.826	750.881	753.268	752.951	628.061
V_{Z8}	738.226	804.935	791.638	788.108	789.187	777.733	746.545	677.679
V_{Z9}	644.948	729.577	776.215	775.941	747.568	749.492	750.669	626.067
$V_{\theta 8}$	776.514	788.371	746.777	716.502	646.806	611.357	603.483	583.751
$V_{\theta 9}$	75.726	90.978	66.262	61.933	61.908	72.150	57.490	49.523
M_8	.987	1.049	1.005	.979	.931	.896	.860	.794
M_9	.565	.646	.687	.686	.659	.660	.656	.540
$\Delta\beta$	39.709	37.257	38.414	37.682	34.589	32.667	34.571	36.219
$\bar{\omega}$	.332	.219	.141	.120	.133	.134	.117	.224
$\bar{\omega}\ \mathrm{Cos}\,\beta_9/2\sigma$	.086	.058	.039	.035	.042	.044	.040	.079
D	.558	.506	.452	.446	.445	.416	.413	.509
η_p	.588	.719	.789	.810	.781	.752	.764	.634
i_m	2.946	2.236	3.913	4.098	3.749	4.103	5.520	7.211
i_s	-1.614	-2.524	-1.467	-1.872	-3.111	-3.627	-2.620	-.849
$\delta°$	17.577	17.699	14.999	14.595	14.719	16.066	16.089	16.723

PERCENT DESIGN SPEED, $\frac{N/\sqrt{\theta}}{N/\sqrt{\theta}\ \mathrm{DESIGN}} \times 100 = 98.3680$

CORRECTED ROTOR SPEED, $N/\sqrt{\theta} = 8725.240$

CORRECTED WEIGHT FLOW, $W\sqrt{\theta}/\delta = 135.930$

CORRECTED FLOW PER UNIT FRONTAL AREA, $\frac{W\sqrt{\theta}/\delta}{A_f} = 25.9359$

CORRECTED FLOW PER UNIT ANNULUS AREA, $\frac{W\sqrt{\theta}/\delta}{A_{an}} = 36.1516$

TABLE 4-2

BLADE ELEMENT PERFORMANCE, MCA STATOR B
100% DESIGN SPEED, POINT 2

STATOR

% SPAN	95	90	80	70	50	30	10	05
Dia.	22.300	22.680	23.670	24.480	26.350	28.190	30.000	30.540
β_8	47.644	45.862	45.382	44.601	41.657	41.400	41.230	42.540
β_9	6.606	7.851	5.259	2.934	1.311	1.976	4.840	4.958
V_8	1077.883	1125.447	1088.980	1070.949	1021.861	999.434	965.074	912.721
V_9	551.252	618.650	680.574	707.040	702.485	704.880	670.710	559.343
V_{Z8}	724.646	782.157	763.601	761.504	762.933	749.491	725.692	672.487
V_{Z9}	545.994	611.183	676.198	704.803	701.577	704.163	668.244	557.217
$V_{\theta 8}$	796.520	807.696	775.147	751.981	679.197	660.938	636.161	517.097
$V_{\theta 9}$	63.415	84.504	62.383	36.186	16.067	24.299	56.595	48.342
M_8	.987	1.040	.998	.977	.925	.897	.858	.806
M_9	.472	.533	.589	.613	.609	.608	.575	.475
$\Delta\beta$	41.038	38.011	40.123	41.667	40.346	39.424	36.397	37.582
$\bar{\omega}$	.286	.208	.134	.077	.047	.057	.128	.218
$\bar{\omega}\ \mathrm{Cos}\,\beta_9/2\sigma$	.074	.055	.037	.022	.015	.019	.044	.077
D	.661	.616	.552	.533	.517	.502	.514	.608
η_p	.697	.778	.839	.900	.934	.907	.805	.711
i_m	4.204	3.752	6.012	6.461	6.087	7.340	7.808	9.010
i_s	-.356	-1.008	.632	.491	-.773	-.390	-.332	.950
$\delta°$	17.50[illegible]	18.461	15.389	12.974	11.301	12.546	16.550	17.158

PERCENT DESIGN SPEED, $\frac{N/\sqrt{\theta}}{N/\sqrt{\theta}\ \mathrm{DESIGN}} \times 100 = 99.7726$

CORRECTED ROTOR SPEED, $N/\sqrt{\theta} = 8849.830$

CORRECTED WEIGHT FLOW, $W\sqrt{\theta}/\delta = 132.920$

CORRECTED FLOW PER UNIT FRONTAL AREA, $\frac{W\sqrt{\theta}/\delta}{A_f} = 25.3616$

CORRECTED FLOW PER UNIT ANNULUS AREA, $\frac{W\sqrt{\theta}/\delta}{A_{an}} = 35.3511$

TABLE 4-3

BLADE ELEMENT PERFORMANCE, MCA STATOR B
100% DESIGN SPEED, POINT 3

STATOR

% SPAN	95	90	80	70	50	30	10	05
Dia.	22.300	22.680	23.670	24.480	26.350	28.190	30.000	30.540
β_8	50.240	48.323	47.822	47.011	44.215	43.164	45.727	46.792
β_9	4.914	6.749	5.510	2.832	1.142	1.230	3.576	3.590
V_8	1045.013	1093.185	1062.544	1049.130	999.894	965.335	951.561	906.961
V_9	506.016	571.861	631.211	662.086	662.645	656.458	652.894	546.090
V_{Z8}	666.235	725.442	712.294	714.434	716.191	703.955	664.250	620.946
V_{Z9}	502.703	566.374	626.923	660.084	661.160	656.044	651.556	544.988
$V_{\theta 8}$	803.920	816.510	787.407	767.427	697.275	660.374	681.334	661.056
$V_{\theta 9}$	43.342	67.209	60.613	32.708	13.204	14.093	40.722	34.198
M_8	.949	1.001	.965	.949	.898	.860	.836	.792
M_9	.431	.489	.542	.569	.570	.563	.554	.459
$\Delta\beta$	45.377	41.574	42.311	44.180	43.073	41.934	42.151	43.201
$\bar{\omega}$	.276	.201	.159	.111	.082	.082	.120	.224
$\bar{\omega}\cos\beta_9/2\sigma$	.071	.053	.044	.032	.026	.027	.042	.079
D	.700	.654	.591	.572	.553	.538	.548	.643
η_p	.714	.790	.816	.862	.888	.876	.820	.707
i_m	6.850	6.213	8.452	8.871	8.645	9.104	12.297	13.262
i_s	2.290	1.453	3.072	2.901	1.785	1.374	4.157	5.202
$\delta°$	15.814	17.359	15.640	12.872	11.132	11.800	15.286	15.790

PERCENT DESIGN SPEED, $\frac{N/\sqrt{\theta}}{N/\sqrt{\theta}\ \text{DESIGN}} \times 100 = 99.9027$

CORRECTED FLOW PER UNIT FRONTAL AREA, $\frac{W\sqrt{\theta}/\delta}{A_f} = 24.5087$

CORRECTED ROTOR SPEED, $N/\sqrt{\theta} = 8861.370$

CORRECTED FLOW PER UNIT ANNULUS AREA, $\frac{W\sqrt{\theta}/\delta}{A_{an}} = 34.1622$

CORRECTED WEIGHT FLOW, $W\sqrt{\theta}/\delta = 128.450$

TABLE 4-4

BLADE ELEMENT PERFORMANCE, MCA STATOR B
100% DESIGN SPEED, POINT 4

STATOR

% SPAN	95	90	80	70	50	30	10	05
Dia.	22.300	22.680	23.670	24.480	26.350	28.190	30.000	30.540
β_8	50.669	48.829	48.811	48.081	44.623	45.152	49.827	50.172
β_9	5.330	7.222	6.067	3.319	2.067	2.847	3.815	3.660
V_8	1058.591	1101.277	1073.716	1066.326	1006.007	948.362	914.243	882.347
V_9	507.175	570.384	639.416	670.611	649.407	616.188	595.497	503.155
V_{Z8}	669.638	723.682	706.102	711.625	715.666	668.711	589.763	565.121
V_{Z9}	503.676	564.505	634.620	668.447	648.459	615.234	594.134	502.109
$V_{\theta 8}$	818.820	828.989	808.020	793.437	706.654	672.365	698.577	677.621
$V_{\theta 9}$	47.110	71.710	67.583	38.828	23.420	30.606	39.621	32.119
M_8	.960	1.006	.972	.962	.901	.840	.796	.764
M_9	.430	.486	.547	.574	.556	.524	.500	.420
$\Delta\beta$	45.340	41.607	42.744	44.761	42.556	42.304	46.012	46.512
$\bar{\omega}$	.281	.202	.152	.126	.131	.128	.124	.256
$\bar{\omega}\cos\beta_9/2\sigma$	.073	.053	.042	.037	.041	.042	.043	.091
D	.706	.660	.591	.576	.568	.571	.599	.689
η_p	.711	.790	.823	.844	.826	.817	.824	.678
i_m	7.229	6.719	9.441	9.941	9.053	11.092	16.397	16.642
i_s	2.669	1.959	4.061	3.971	2.193	3.362	8.257	8.582
$\delta°$	16.230	17.832	16.197	13.359	12.057	13.417	15.525	15.860

PERCENT DESIGN SPEED, $\frac{N/\sqrt{\theta}}{N/\sqrt{\theta}\ \text{DESIGN}} \times 100 = 99.9492$

CORRECTED FLOW PER UNIT FRONTAL AREA, $\frac{W\sqrt{\theta}/\delta}{A_f} = 23.6787$

CORRECTED ROTOR SPEED, $N/\sqrt{\theta} = 8665.490$

CORRECTED FLOW PER UNIT ANNULUS AREA, $\frac{W\sqrt{\theta}/\delta}{A_{an}} = 33.0053$

CORRECTED WEIGHT FLOW, $W\sqrt{\theta}/\delta = 124.100$

TABLE 4-5

BLADE ELEMENT PERFORMANCE, MCA STATOR B
100% DESIGN SPEED, POINT 5

STATOR

% SPAN	95	90	80	70	50	30	10	05
Dia.	22.300	22.680	23.670	24.480	26.350	28.190	30.000	30.540
β_8	51.719	49.611	49.932	49.890	47.289	48.531	53.075	53.654
β_9	6.406	7.873	6.461	4.407	2.813	2.248	.045	-.731
V_8	1049.780	1093.645	1067.633	1055.845	982.902	920.509	900.561	867.411
V_9	520.128	590.820	636.803	645.375	605.447	561.208	550.323	467.352
V_{Z8}	649.252	707.540	686.404	679.606	666.433	609.504	541.026	513.713
V_{Z9}	515.683	584.004	631.694	643.092	604.299	560.629	550.291	467.300
$V_{\theta 8}$	824.057	832.990	817.039	807.519	722.217	689.746	719.928	698.927
$V_{\theta 9}$	58.029	80.929	71.653	49.625	29.710	22.017	.428	-5.960
M_8	.949	.996	.963	.947	.874	.808	.778	.746
M_9	.441	.504	.543	.549	.514	.474	.459	.387
$\Delta\beta$	45.313	41.738	43.471	45.483	44.476	46.282	53.030	54.415
$\bar{\omega}$	.255	.159	.137	.142	.151	.165	.190	.290
$\bar{\omega} \cos\beta_9/2\sigma$	.066	.042	.038	.041	.048	.054	.066	.103
D	.689	.637	.592	.596	.606	.627	.667	.749
η_p	.733	.830	.839	.829	.807	.779	.747	.647
i_m	8.279	7.501	10.562	11.750	11.719	14.471	19.645	20.154
i_s	3.719	2.741	5.182	5.780	4.859	6.741	11.505	12.094
$\delta°$	17.306	18.483	16.591	14.447	12.803	12.818	11.755	11.469

PERCENT DESIGN SPEED, $\dfrac{N/\sqrt{\theta}}{N/\sqrt{\theta}\ \text{DESIGN}} \times 100$ = 99.9402

CORRECTED ROTOR SPEED, $N/\sqrt{\theta}$ = 8864.700

CORRECTED WEIGHT FLOW, $W\sqrt{\theta}/\delta$ = 121.020

CORRECTED FLOW PER UNIT FRONTAL AREA, $\dfrac{W\sqrt{\theta}/\delta}{A_f}$ = 23.0910

CORRECTED FLOW PER UNIT ANNULUS AREA, $\dfrac{W\sqrt{\theta}/\delta}{A_{an}}$ = 32.18[illegible]2

TABLE 4-6

BLADE ELEMENT PERFORMANCE, MCA STATOR B
100% DESIGN SPEED, POINT 6

STATOR

% SPAN	95	90	80	70	50	30	10	05
Dia.	22.300	22.680	23.670	24.480	26.350	28.190	30.000	30.540
β_8	51.370	49.476	49.638	49.614	47.814	49.187	54.606	55.814
β_9	6.233	7.273	6.264	4.429	2.953	2.321	.060	-.770
V_8	1061.656	1101.544	1075.608	1063.211	990.228	926.293	908.419	870.131
V_9	523.920	592.634	637.136	643.247	598.900	548.588	542.917	461.394
V_{Z8}	661.756	714.748	695.840	688.335	664.755	605.361	526.144	488.914
V_{Z9}	519.714	586.719	632.369	640.548	597.745	548.015	542.891	461.340
$V_{\theta 8}$	829.365	837.316	819.581	809.850	733.729	701.065	740.537	719.785
$V_{\theta 9}$	56.880	75.029	69.515	49.673	30.855	22.220	.565	-6.201
M_8	.960	1.003	.971	.954	.879	.812	.783	.746
M_9	.444	.505	.543	.547	.507	.461	.450	.380
$\Delta\beta$	45.138	42.202	43.374	45.185	44.861	46.866	54.547	55.584
$\bar{\omega}$	.244	.153	.136	.145	.158	.179	.194	.290
$\bar{\omega} \cos\beta_9/2\sigma$	.063	.040	.037	.042	.050	.059	.068	.103
D	.691	.641	.596	.602	.619	.647	.686	.765
η_p	.747	.839	.843	.828	.803	.771	.748	.652
i_m	7.930	7.366	10.268	11.474	12.244	15.127	21.176	22.284
i_s	3.370	2.606	4.888	5.504	5.384	7.397	13.036	14.224
$\delta°$	17.133	17.883	16.394	14.469	12.943	12.891	11.770	11.430

PERCENT DESIGN SPEED, $\dfrac{N/\sqrt{\theta}}{N/\sqrt{\theta}\ \text{DESIGN}} \times 100$ = 99.9752

CORRECTED ROTOR SPEED, $N/\sqrt{\theta}$ = 8867.800

CORRECTED WEIGHT FLOW, $W\sqrt{\theta}/\delta$ = 119.030

CORRECTED FLOW PER UNIT FRONTAL AREA, $\dfrac{W\sqrt{\theta}/\delta}{A_f}$ = 22.7113

CORRECTED FLOW PER UNIT ANNULUS AREA, $\dfrac{W\sqrt{\theta}/\delta}{A_{an}}$ = 31.6569

TABLE 5-1

BLADE ELEMENT PERFORMANCE, MCA STATOR B
110% DESIGN SPEED, POINT 1

STATOR

% SPAN	95	90	80	70	50	30	10	05
Dia	22.300	22.680	23.670	24.480	26.350	28.190	30.000	30.540
β_8	46.784	45.076	44.464	43.750	40.731	39.087	41.315	42.838
β_9	10.009	12.249	.514	-.849	-.547	3.573	4.546	2.438
V_8	1151.952	1204.620	1169.253	1150.690	1109.735	1090.490	1045.072	982.419
V_9	601.550	717.600	780.164	797.397	787.715	791.006	770.427	627.797
V_{Z8}	787.115	848.946	833.107	830.112	840.357	846.222	764.920	720.383
V_{Z9}	590.689	699.378	778.415	795.850	786.873	789.126	767.910	627.186
$V_{\theta 8}$	839.511	852.931	819.022	795.711	724.114	687.553	689.955	667.969
$V_{\theta 9}$	104.552	152.252	7.002	-11.810	-7.520	49.289	61.059	26.704
M_8	1.060	1.120	1.077	1.054	1.009	.985	.928	.864
M_9	.513	.619	.677	.692	.682	.684	.659	.529
$\Delta\beta$	36.774	32.827	43.950	44.598	41.278	35.514	36.769	40.400
$\bar{\omega}$	.403	.287	.184	.129	.116	.139	.130	.254
$\bar{\omega} \cos\beta_9/2\sigma$	.103	.074	.051	.038	.038	.045	.045	.090
D	.639	.554	.521	.510	.498	.465	.472	.592
η_p	.567	.678	.767	.826	.828	.780	.784	.651
i_m	3.344	2.966	5.094	5.610	5.161	5.027	7.885	9.308
i_s	-1.216	-1.794	-.286	-.360	-1.699	-2.703	-.255	1.248
$\delta°$	20.909	22.859	10.644	9.191	9.443	14.14[illegible]	16.256	14.638

PERCENT DESIGN SPEED, $\frac{N/\sqrt{\theta}}{N/\sqrt{\theta}\ \text{DESIGN}} \times 100$ = 109.9165

CORRECTED ROTOR SPEED, $N/\sqrt{\theta}$ = 9749.599

CORRECTED WEIGHT FLOW, $W\sqrt{\theta}/\delta$ = 141.910

CORRECTED FLOW PER UNIT FRONTAL AREA, $\frac{W\sqrt{\theta}/\delta}{A_f}$ = 27.0759

CORRECTED FLOW PER UNIT ANNULUS AREA, $\frac{W\sqrt{\theta}/\delta}{A_{an}}$ = 37.7420

TABLE 5-2

BLADE ELEMENT PERFORMANCE, MCA STATOR B
110% DESIGN SPEED, POINT 2

STATOR

% SPAN	95	90	80	70	50	30	10	05
Dia	22.300	22.680	23.670	24.480	26.350	28.190	30.000	30.540
β_8	50.450	48.130	47.256	46.115	42.057	41.892	42.191	43.063
β_9	6.187	13.231	9.039	5.591	1.786	2.561	4.738	4.075
V_8	1109.233	1170.046	1147.210	1141.858	1105.591	1099.531	1055.693	1009.789
V_9	501.757	578.059	651.212	702.977	741.724	754.107	724.674	603.104
V_{Z8}	704.564	779.122	777.142	790.313	820.190	818.229	782.136	737.734
V_{Z9}	497.195	560.983	641.490	698.144	740.473	752.969	722.095	601.533
$V_{\theta 8}$	855.290	871.267	842.510	822.969	740.595	734.191	709.006	689.491
$V_{\theta 9}$	54.078	132.306	102.306	68.487	23.114	33.690	59.863	42.855
M_8	1.008	1.075	1.047	1.038	1.000	.985	.934	.887
M_9	.423	.490	.555	.600	.637	.643	.614	.505
$\Delta\beta$	44.262	34.699	38.218	40.524	40.271	39.332	37.452	38.989
$\bar{\omega}$	.285	.241	.189	.123	.050	.077	.113	.2[illegible]7
$\bar{\omega} \cos\beta_9/2\sigma$	.074	.062	.051	.036	.016	.025	.039	.073
D	.731	.669	.606	.575	.534	.522	.527	.630
η_p	.721	.764	.799	.864	.935	.886	.838	.743
i_m	7.010	6.020	7.886	7.975	6.487	7.832	8.761	9.533
i_s	2.450	1.260	2.506	2.005	-.373	.102	.621	1.473
$\delta°$	17.087	23.841	19.169	15.631	11.776	13.131	16.448	16.275

PERCENT DESIGN SPEED, $\frac{N/\sqrt{\theta}}{N/\sqrt{\theta}\ \text{DESIGN}} \times 100$ = 109.9848

CORRECTED ROTOR SPEED, $N/\sqrt{\theta}$ = 9755.650

CORRECTED WEIGHT FLOW, $W\sqrt{\theta}/\delta$ = 140.080

CORRECTED FLOW PER UNIT FRONTAL AREA, $\frac{W\sqrt{\theta}/\delta}{A_f}$ = 26.7277

CORRECTED FLOW PER UNIT ANNULUS AREA, $\frac{W\sqrt{\theta}/\delta}{A_{an}}$ = 37.2553

TABLE 5-3

BLADE ELEMENT PERFORMANCE, MCA STATOR B
110% DESIGN SPEED, POINT 3

STATOR

% SPAN	95	90	80	70	50	30	10	05
Dia.	22.300	22.660	23.670	24.480	26.350	28.190	30.000	30.540
β_8	49.760	48.244	47.857	46.809	43.357	43.058	46.364	47.201
β_9	6.775	12.016	8.876	4.712	.929	1.973	3.780	3.013
V_8	1127.567	1170.993	1135.046	1124.986	1086.912	1069.246	1050.286	1006.058
V_9	536.647	594.297	633.811	662.682	695.099	704.512	697.397	584.542
V_{Z8}	726.829	778.270	760.361	768.975	789.761	781.075	724.752	683.533
V_{Z9}	531.335	579.684	624.819	659.215	694.296	703.796	695.801	583.698
$V_{\theta 8}$	860.727	873.545	841.605	820.199	746.210	730.018	760.134	738.190
$V_{\theta 9}$	63.311	123.723	97.798	54.442	11.265	24.255	45.982	30.727
M_8	1.027	1.075	1.032	1.019	.978	.953	.919	.874
M_9	.453	.504	.538	.563	.593	.598	.583	.484
$\Delta\beta$	42.985	36.228	38.981	42.096	42.428	41.065	42.584	44.188
$\bar{\omega}$	.249	.190	.156	.134	.079	.088	.111	.204
$\bar{\omega}\ \cos\beta_9/2\sigma$	.064	.049	.042	.039	.025	.029	.039	.072
D	.703	.658	.618	.608	.574	.556	.572	.668
η_p	.755	.813	.836	.853	.902	.881	.847	.753
i_m	6.320	6.134	8.487	8.669	7.787	8.998	12.934	13.671
i_s	1.760	1.374	3.107	2.699	.927	1.268	4.794	5.611
$\delta°$	17.675	22.626	19.006	14.752	10.919	12.543	15.490	15.213

PERCENT DESIGN SPEED, $\frac{N/\sqrt{\theta}}{N/\sqrt{\theta}\ \text{DESIGN}} \times 100 = 109.9311$

CORRECTED ROTOR SPEED, $N/\sqrt{\theta} = 9750.890$

CORRECTED WEIGHT FLOW, $w\sqrt{\theta}/\delta = 138.410$

CORRECTED FLOW PER UNIT FRONTAL AREA, $\frac{w\sqrt{\theta}/\delta}{A_f} = 26.4091$

CORRECTED FLOW PER UNIT ANNULUS AREA, $\frac{w\sqrt{\theta}/\delta}{A_{an}} = 36.8112$

TABLE 5-4

BLADE ELEMENT PERFORMANCE, MCA STATOR B
110% DESIGN SPEED, POINT 4

STATOR

% SPAN	95	90	80	70	50	30	10	05
Dia.	22.300	22.680	23.670	24.480	26.350	28.190	30.000	30.540
β_8	52.936	50.693	50.459	49.339	45.909	47.103	49.201	51.322
β_9	4.860	7.620	5.971	3.303	.993	1.375	-1.054	-1.859
V_8	1114.253	1165.030	1126.258	1116.879	1062.157	1027.245	1040.988	980.880
V_9	500.156	577.323	631.055	663.631	661.555	638.410	656.905	548.910
V_{Z8}	669.949	736.407	715.861	726.901	738.745	699.198	680.179	612.981
V_{Z9}	496.877	570.661	626.286	661.392	660.894	638.024	656.728	548.591
$V_{\theta 8}$	889.133	901.458	868.541	847.236	762.884	752.536	788.029	765.741
$V_{\theta 9}$	42.371	76.556	65.645	38.234	11.468	15.321	-12.088	-17.805
M_8	1.005	1.061	1.015	1.002	.946	.903	.902	.843
M_9	.419	.486	.532	.560	.559	.535	.543	.450
$\Delta\beta$	48.076	43.073	44.488	46.036	44.916	45.728	50.255	53.181
$\bar{\omega}$	.288	.195	.157	.129	.120	.159	.247	.281
$\bar{\omega}\ \cos\beta_9/2\sigma$	.074	.051	.043	.038	.038	.052	.086	.100
D	.744	.688	.632	.615	.600	.612	.636	.723
η_p	.719	.809	.832	.852	.851	.789	.673	.661
i_m	9.496	8.583	11.089	11.199	10.339	13.043	15.771	17.792
i_s	4.936	3.823	5.709	5.229	3.479	5.313	7.631	9.732
$\delta°$	15.760	18.2[illegible]	16.101	13.343	10.983	11.945	10.656	10.341

PERCENT DESIGN SPEED, $\frac{N/\sqrt{\theta}}{N/\sqrt{\theta}\ \text{DESIGN}} \times 100 = 110.0210$

CORRECTED ROTOR SPEED, $N/\sqrt{\theta} = 9758.860$

CORRECTED WEIGHT FLOW, $w\sqrt{\theta}/\delta = 133.220$

CORRECTED FLOW PER UNIT FRONTAL AREA, $\frac{w\sqrt{\theta}/\delta}{A_f} = 25.4188$

CORRECTED FLOW PER UNIT ANNULUS AREA, $\frac{w\sqrt{\theta}/\delta}{A_{an}} = 35.4309$

TABLE 5-5

BLADE ELEMENT PERFORMANCE, MCA STATOR B 110% DESIGN SPEED, POINT 5

STATOR

% SPAN	95	90	80	70	50	30	10	05
Dia.	22.300	22.680	23.670	24.480	26.350	28.190	30.000	30.540
β_8	52.256	50.123	49.794	48.919	46.990	48.595	52.736	53.786
β_9	4.454	6.440	5.576	4.473	2.343	1.331	-1.034	-1.260
V_8	1126.595	1176.308	1141.210	1128.331	1059.479	1009.920	990.050	947.961
V_9	542.260	617.358	664.168	676.464	633.168	598.301	599.564	503.658
V_{Z8}	689.574	752.896	735.730	740.707	722.359	667.849	599.456	560.057
V_{Z9}	539.293	612.071	659.836	673.420	632.159	597.964	599.425	503.518
$V_{\theta 8}$	892.443	902.728	871.571	850.511	774.734	757.489	787.935	764.829
$V_{\theta 9}$	42.112	69.246	64.529	52.762	25.882	13.892	-10.815	-11.079
M_8	1.019	1.072	1.030	1.013	.941	.883	.851	.809
M_9	.455	.521	.561	.571	.533	.499	.493	.411
$\Delta\beta$	47.802	43.683	44.218	44.445	44.648	47.264	53.769	55.046
$\bar{\omega}$	.261	.169	.138	.140	.165	.201	.215	.307
$\bar{\omega}\ \mathrm{Cos}\,\beta_9/2\sigma$	.068	.044	.038	.041	.052	.066	.075	.109
D	.711	.658	.609	.605	.625	.647	.675	.759
η_p	.740	.830	.847	.839	.802	.748	.725	.639
i_m	6.816	8.013	10.424	10.779	11.420	14.535	19.306	20.256
i_s	4.256	3.253	5.044	4.809	4.560	6.805	11.166	12.196
$\delta°$	15.354	17.050	15.706	14.513	12.333	11.901	10.676	10.940

PERCENT DESIGN SPEED, $\frac{N/\sqrt{\theta} \times 100}{N/\sqrt{\theta}\ \mathrm{DESIGN}} = 109.8912$

CORRECTED ROTOR SPEED, $N/\sqrt{\theta} = 9747.350$

CORRECTED WEIGHT FLOW, $W\sqrt{\theta}/\delta = 130.570$

CORRECTED FLOW PER UNIT FRONTAL AREA, $\frac{W\sqrt{\theta}/\delta}{A_f} = 24.9132$

CORRECTED FLOW PER UNIT ANNULUS AREA, $\frac{W\sqrt{\theta}/\delta}{A_{an}} = 34.7261$

TABLE 5-6

BLADE ELEMENT PERFORMANCE, MCA STATOR B 110% DESIGN SPEED, POINT 6

STATOR

% SPAN	95	90	80	70	50	30	10	05
Dia.	22.300	22.680	23.670	24.480	26.350	28.190	30.000	30.540
β_8	52.015	50.072	49.957	49.369	47.478	49.625	54.607	56.132
β_9	4.479	6.401	5.601	4.462	2.316	1.313	-1.035	-1.267
V_8	1139.066	1183.172	1149.413	1136.004	1060.329	1005.050	983.903	938.235
V_9	542.871	619.784	666.244	671.656	621.233	580.247	574.823	479.314
V_{Z8}	699.867	758.227	738.621	739.094	716.376	650.988	569.856	522.854
V_{Z9}	539.994	614.646	661.987	668.748	620.313	579.946	57[illegible].694	479.180
$V_{\theta 8}$	897.781	907.315	879.953	862.136	781.483	765.668	802.074	779.042
$V_{\theta 9}$	42.395	69.102	65.021	52.250	25.106	13.298	-10.387	-10.601
M_8	1.030	1.078	1.037	1.019	.940	.877	.842	.797
M_9	.455	.522	.562	.566	.521	.482	.470	.389
$\Delta\beta$	47.536	43.670	44.357	44.907	45.162	48.312	55.642	57.400
$\bar{\omega}$	.259	.167	.137	.150	.174	.204	.223	.312
$\bar{\omega}\ \mathrm{Cos}\,\beta_9/2\sigma$	.067	.044	.037	.044	.055	.067	.078	.111
D	.714	.659	.612	.615	.639	.667	.703	.787
η_p	.745	.833	.849	.830	.795	.752	.724	.640
i_m	8.575	7.962	10.587	11.229	11.908	15.565	21.177	22.602
i_s	4.015	3.202	5.207	5.259	5.048	7.835	13.037	14.542
$\delta°$	15.379	17.011	15.731	14.502	12.306	11.883	10.675	10.933

PERCENT DESIGN SPEED, $\frac{N/\sqrt{\theta} \times 100}{N/\sqrt{\theta}\ \mathrm{DESIGN}} = 109.6313$

CORRECTED ROTOR SPEED, $N/\sqrt{\theta} = 9724.300$

CORRECTED WEIGHT FLOW, $W\sqrt{\theta}/\delta = 128.340$

CORRECTED FLOW PER UNIT FRONTAL AREA, $\frac{W\sqrt{\theta}/\delta}{A_f} = 24.4877$

CORRECTED FLOW PER UNIT ANNULUS AREA, $\frac{W\sqrt{\theta}/\delta}{A_{an}} = 34.1330$

TABLE 6-1

BLADE ELEMENT PERFORMANCE, MCA STATOR B
120% DESIGN SPEED, POINT 1

STATOR

% SPAN	95	90	80	70	50	30	10	05
Dia.	22.300	22.680	23.670	24.480	26.350	28.190	30.000	30.540
β_8	48.333	46.380	45.201	44.256	42.288	41.781	43.572	45.255
β_9	26.877	29.657	11.025	6.379	8.754	11.258	13.101	12.397
V_8	1222.807	1282.267	1242.836	1216.765	1170.653	1162.565	1078.056	1011.628
V_9	688.437	849.118	818.008	805.537	812.286	846.444	782.959	628.178
V_{Z8}	811.260	882.902	874.387	870.382	865.457	866.720	781.041	712.133
V_{Z9}	612.395	736.006	801.242	799.172	802.058	829.814	762.486	613.489
$V_{\theta 8}$	913.459	928.277	881.907	849.145	787.679	774.603	743.064	718.503
$V_{\theta 9}$	311.225	420.153	156.440	89.497	123.616	165.242	177.473	134.855
M_8	1.122	1.191	1.144	1.113	1.058	1.039	.946	.878
M_9	.583	.733	.703	.690	.695	.721	.660	.521
$\Delta\beta$	21.456	16.723	34.175	37.878	33.534	30.524	30.471	32.858
$\bar{\omega}$	.378	.234	.216	.209	.162	.139	.143	.275
$\bar{\omega}\ \mathrm{Cos}\,\beta_9/2\sigma$	.088	.054	.058	.061	.051	.045	.049	.095
D	.559	.437	.499	.518	.485	.442	.456	.583
η_p	.585	.717	.736	.740	.777	.783	.772	.637
i_m	4.893	4.270	5.831	6.116	6.718	7.721	10.142	11.725
i_s	.333	-.490	.451	.146	-.142	-.009	2.002	3.665
$\delta°$	37.777	40.267	2..155	16.419	18.744	21.828	24.811	24.597

PERCENT DESIGN SPEED, $\frac{N/\sqrt{\theta} \times 100}{N/\sqrt{\theta}\ \mathrm{DESIGN}}$ = 119.7744

CORRECTED ROTOR SPEED, $N/\sqrt{\theta}$ = 10623.990

CORRECTED WEIGHT FLOW, $W\sqrt{\theta}/\delta$ = 146.530

CORRECTED FLOW PER UNIT FRONTAL AREA, $\frac{W\sqrt{\theta}/\delta}{A_f}$ = 77.9504

CORRECTED FLOW PER UNIT ANNULUS AREA, $\frac{W\sqrt{\theta}/\delta}{A_{an}}$ = 38.9707

TABLE 6-2

BLADE ELEMENT PERFORMANCE, MCA STATOR B
120% DESIGN SPEED, POINT 2

STATOR

% SPAN	95	90	80	70	50	30	10	05
Dia.	22.300	22.680	23.670	24.480	26.350	28.190	30.000	30.540
β_8	55.508	50.216	48.029	46.488	42.525	43.154	45.479	47.009
β_9	.680	7.494	3.617	1.132	.777	1.416	-.907	-3.646
V_8	1119.536	1195.631	1199.473	1199.522	1172.706	1165.622	1103.945	1042.972
V_9	443.558	541.788	670.318	722.594	762.985	773.236	728.190	602.531
V_{Z8}	632.447	763.333	800.679	824.659	863.616	850.120	774.022	711.178
V_{Z9}	442.112	535.563	667.354	720.992	762.064	772.634	728.001	601.268
$V_{\theta 8}$	922.724	918.803	891.791	869.929	792.639	797.234	787.109	762.890
$V_{\theta 9}$	5.263	70.656	42.285	14.279	10.351	19.107	-11.522	-38.319
M_8	1.006	1.090	1.091	1.088	1.058	1.037	.963	.901
M_9	.368	.453	.565	.611	.648	.650	.604	.494
$\Delta\beta$	54.828	42.723	44.412	45.356	41.747	41.738	46.386	50.655
$\bar{\omega}$	.267	.280	.192	.156	.102	.117	.135	.213
$\bar{\omega}\ \mathrm{Cos}\,\beta_9/2\sigma$	.069	.073	.053	.046	.033	.038	.047	.075
D	.812	.730	.633	.604	.560	.554	.592	.694
η_p	.754	.737	.805	.833	.876	.842	.820	.746
i_m	12.068	8.106	8.659	6.348	6.955	9.094	12.049	13.479
i_s	7.508	3.346	3.279	2.378	.095	1.364	3.909	5.419
$\delta°$	11.580	18.104	13.747	11.172	10.767	11.986	10.803	8.554

PERCENT DESIGN SPEED, $\frac{N/\sqrt{\theta} \times 100}{N/\sqrt{\theta}\ \mathrm{DESIGN}}$ = 119.6939

CORRECTED ROTOR SPEED, $N/\sqrt{\theta}$ = 10616.850

CORRECTED WEIGHT FLOW, $W\sqrt{\theta}/\delta$ = 145.150

CORRECTED FLOW PER UNIT FRONTAL AREA, $\frac{W\sqrt{\theta}/\delta}{A_f}$ = 77.6951

CORRECTED FLOW PER UNIT ANNULUS AREA, $\frac{W\sqrt{\theta}/\delta}{A_{an}}$ = 38.6037

TABLE 6-3

BLADE ELEMENT PERFORMANCE, MCA STATOR B
120% DESIGN SPEED, POINT 3

STATOR

% SPAN	95	90	80	70	50	30	10	05
Dia.	22.300	22.680	23.670	24.480	26.350	28.190	30.000	30.540
β_8	53.612	51.707	49.436	47.414	43.077	44.587	47.731	49.187
β_9	-3.796	.499	6.650	1.823	.063	.954	-.646	-2.264
V_8	1138.042	1187.746	1179.106	1179.758	1152.447	1151.634	1100.511	1043.228
V_9	437.662	514.562	635.361	700.161	748.934	747.107	713.855	592.383
V_{Z8}	673.609	734.452	765.476	797 263	841.229	819.991	740.191	681.844
V_{Z9}	435.357	513.067	629.613	698.455	748.145	746.676	713.723	591.881
$V_{\theta 8}$	916.144	932.209	895.739	868.609	787.095	808.435	814.376	789.558
$V_{\theta 9}$	-28.978	4.479	73.575	22.279	.822	12.440	-8.046	-23.405
M_8	1.023	1.077	1.066	1.065	1.036	1.018	.953	.895
M_9	.362	.428	.533	.590	.635	.624	.588	.483
$\Delta\beta$	57.408	51.208	42.786	45.590	43.014	43.633	48.377	51.451
$\bar{\omega}$	.311	.260	.224	.163	.088	.130	.146	.218
$\bar{\omega} \cos\beta_9/2\sigma$	.081	.069	.061	.048	.028	.043	.051	.077
D	.827	.769	.650	.614	.565	.576	.611	.708
η_p	.715	.761	.772	.824	.894	.832	.809	.744
i_m	10.172	9.597	10.066	9.274	7.507	10.527	14.301	15.657
i_s	5.612	4.837	4.686	3.304	.647	2.797	6.161	7.597
$\delta°$	7.104	11.109	16.780	11.863	10.053	11.524	11.064	9.936

PERCENT DESIGN SPEED, $\dfrac{N/\sqrt{\theta}}{N/\sqrt{\theta}\ \text{DESIGN}} \cdot 100 = 120.0672$

CORRECTED ROTOR SPEED, $N/\sqrt{\theta} = 10649.960$

CORRECTED WEIGHT FLOW, $W\sqrt{\theta}/\delta = 143.650$

CORRECTED FLOW PER UNIT FRONTAL AREA, $\dfrac{W\sqrt{\theta}/\delta}{A_f} = 27.4089$

CORRECTED FLOW PER UNIT ANNULUS AREA, $\dfrac{W\sqrt{\theta}/\delta}{A_{an}} = 38.2048$

TABLE 6-4

BLADE ELEMENT PERFORMANCE, MCA STATOR B
120% DESIGN SPEED, POINT 4

STATOR

% SPAN	95	90	80	70	50	30	10	05
Dia.	22.300	22.680	23.670	24.480	26.350	28.190	30.000	30.540
β_8	54.865	51.058	49.240	47.633	43.862	45.658	48.982	50.461
β_9	-4.035	5.115	7.263	2.616	.016	1.794	-1.435	-3.081
V_8	1150.022	1216.831	1205.194	1202.126	1158.797	1157.425	1103.920	1047.651
V_9	440.674	526.922	642.137	698.916	727.593	716.712	687.392	576.888
V_{Z8}	660.328	763.187	785.511	808.982	834.936	808.783	724.471	666.928
V_{Z9}	438.255	523.351	635.530	696.871	726.849	716.059	687.098	576.019
$V_{\theta 8}$	940.485	946.427	912.879	888.181	802.961	827.769	832.917	807.942
$V_{\theta 9}$	-31.011	46.975	81.181	31.900	.201	22.437	-17.216	-31.007
M_8	1.032	1.106	1.090	1.084	1.038	1.019	.952	.895
M_9	.364	.437	.537	.587	.613	.594	.562	.467
$\Delta\beta$	58.900	45.943	41.977	45.017	43.846	43.864	50.418	53.542
$\bar{\omega}$	.269	.245	.193	.154	.092	.157	.164	.232
$\bar{\omega} \cos\beta_9/2\sigma$	.070	.065	.053	.045	.029	.051	.057	.082
D	.832	.758	.654	.625	.591	.607	.645	.733
η_p	.758	.779	.809	.839	.892	.804	.795	.733
i_m	11.425	8.948	9.870	9.493	8.292	11.598	15.552	16.931
i_s	6.865	4.188	4.490	3.523	1.432	3.868	7.412	8.871
$\delta°$	6.865	15.725	17.393	12.656	10.006	12.364	10.275	9.119

PERCENT DESIGN SPEED, $\dfrac{N/\sqrt{\theta}}{N/\sqrt{\theta}\ \text{DESIGN}} \times 100 = 119.9648$

CORRECTED ROTOR SPEED, $N/\sqrt{\theta} = 10640.880$

CORRECTED WEIGHT FLOW, $W\sqrt{\theta}/\delta = 141.590$

CORRECTED FLOW PER UNIT FRONTAL AREA, $\dfrac{W\sqrt{\theta}/\delta}{A_f} = 27.0158$

CORRECTED FLOW PER UNIT ANNULUS AREA, $\dfrac{W\sqrt{\theta}/\delta}{A_{an}} = 37.6569$

TABLE 6-5

BLADE ELEMENT PERFORMANCE, MCA STATOR B
120% DESIGN SPEED, POINT 5

STATOR

% SPAN	95	90	80	70	50	30	10	05
Dia.	22.300	22.680	23.670	24.480	26.350	28.190	30.000	30.540
β_8	51.996	49.539	48.955	48.595	45.060	46.978	51.006	52.629
β_9	-3.792	1.054	6.212	2.746	.054	1.801	-3.070	-4.918
V_8	1158.045	1221.188	1203.685	1192.534	1136.132	1125.9[illegible]	1080.780	1025.292
V_9	448.864	582.199	659.285	691.771	700.201	677.004	660.326	550.869
V_{Z8}	711.585	790.965	789.211	787.777	802.061	768.039	680.054	622.316
V_{Z9}	446.672	580.642	654.083	689.821	699.570	676.420	659.314	548.811
$V_{\theta 8}$	912.497	929.138	907.809	894.457	804.203	823.135	839.996	814.825
$V_{\theta 9}$	-29.688	10.709	71.343	33.140	.663	21.279	-35.367	-47.229
M_8	1.044	1.114	1.089	1.071	1.012	.986	.926	.871
M_9	.372	.487	.553	.579	.588	.559	.538	.445
$\Delta\beta$	55.788	48.485	42.742	45.849	45.005	45.176	54.076	57.548
$\bar{\omega}$	.312	.158	.1[illegible]5	.140	.112	.181	.183	.261
$\bar{\omega} \cos\beta_9 / 2\sigma$	.081	.042	.051	.041	.035	.059	.064	.092
D	.819	.718	.640	.629	.607	.631	.671	.761
η_p	.716	.856	.817	.853	.868	.778	.773	.700
i_m	8.556	7.429	9.585	10.455	9.490	12.918	17.576	19.099
i_s	3.996	2.669	4.205	4.485	2.630	5.188	9.436	11.039
$\delta°$	7.108	11.664	16.342	12.786	10.044	12.371	8.640	7.282

PERCENT DESIGN SPEED, $\frac{N/\sqrt{\theta}}{N/\sqrt{\theta}\ \text{DESIGN}} \times 100$ = 119.8616

CORRECTED ROTOR SPEED, $N/\sqrt{\theta}$ = 10631.720

CORRECTED WEIGHT FLOW, $W\sqrt{\theta}/\delta$ = 139.930

CORRECTED FLOW PER UNIT FRONTAL AREA, $\frac{W\sqrt{\theta}/\delta}{A_f}$ = 26.6991

CORRECTED FLOW PER UNIT ANNULUS AREA, $\frac{W\sqrt{\theta}/\delta}{A_{an}}$ = 37.2154

APPENDIX B

PRESSURE COEFFICIENT DATA TABULATION

TABLE 1-1

PRESSURE COEFFICIENT DATA, MCA STATOR B
50% DESIGN SPEED, POINT 1

% Chord	C_p 10% Span Suction Surface	C_p 10% Span Pressure Surface	S Factor 10% Span Suction Surface	S Factor 10% Span Pressure Surface	C_p 90% Span Pressure Surface	S Factor 90% Span Pressure Surface	% Chord	C_p 90% Span Suction Surface	S Factor 90% Span Suction Surface	% Chord	Hub/Mid Channel Ratio P/P_s
15	-0.411	0.179	1.448	0.857	0.115	0.945	19.2	-0.368	1.429	8.3	0.813
20	-0.485	0.032	1.522	1.005	0.071	0.989	22.6	-0.368	1.429	13.7	0.813
25	-0.448	0.105	1.485	0.931	0.181	0.879	24.7	-0.368	1.429	18.6	0.816
30	-0.559	0.068	1.596	0.968	0.181	0.879	27.9	-0.390	1.451	23.5	0.816
35	-0.522	0.179	1.559	0.857	0.269	0.791	30.3	-0.390	1.451	33.9	0.828
40	-0.669	0.142	1.707	0.894	0.291	0.769	33.6	-0.412	1.473	45.2	0.844
45	-0.669	0.327	1.707	0.709	0.402	0.659	35.8	-0.368	1.429	57.7	0.860
50	-0.854	0.327	1.892	0.709	0.380	0.681	39.4	-0.478	1.539	70.8	
60	-0.743	0.475	1.781	0.562	0.446	0.615	41.1	-0.390	1.451		
70	-0.669	0.438	1.707	0.599	0.446	0.615	51.5	-0.412	1.473		
							56.5	-0.302	1.363		
							61.2	-0.236	1.297		
							70.7	-0.082	1.143		
							79.6	0.137	0.923		

TABLE 1-2

PRESSURE COEFFICIENT DATA, MCA STATOR B
50% DESIGN SPEED, POINT 2

% Chord	C_p 10% Span Suction Surface	C_p 10% Span Pressure Surface	S Factor 10% Span Suction Surface	S Factor 10% Span Pressure Surface	C_p 90% Span Pressure Surface	S Factor 90% Span Pressure Surface	% Chord	C_p 90% Span Suction Surface	S Factor 90% Span Suction Surface	% Chord	Hub/Mid Channel Ratio P/P_s
15	-0.414	0.451	1.450	0.584	0.197	0.862	19.2	-0.308	1.369	8.3	0.820
20	-0.489	0.563	1.525	0.472	0.175	0.884	22.6	-0.286	1.347	13.7	0.827
25	-0.376	0.526	1.412	0.509	0.241	0.818	24.7	-0.308	1.369	18.6	0.830
30	-0.489	0.601	1.525	0.434	0.263	0.796	27.9	-0.308	1.369	23.5	0.833
35	-0.414	0.413	1.450	0.622	0.351	0.708	30.3	-0.286	1.347	33.9	0.842
40	-0.527	0.451	1.563	0.584	0.373	0.686	33.6	-0.308	1.369	45.2	0.860
45	-0.527	0.413	1.563	0.622	0.461	0.598	35.8	-0.264	1.325	57.7	0.873
50	-0.677	0.413	1.713	0.622	0.439	0.620	39.4	-0.352	1.413	70.8	
60	-0.564	0.563	1.600	0.472	0.527	0.532	41.1	-0.286	1.347		
70	-0.489	0.526	1.525	0.509	0.593	0.466	51.5	-0.286	1.347		
							56.5	-0.154	1.215		
							61.2	-0.088	1.149		
							70.7	0.021	1.039		
							79.6	-0.154	1.215		

TABLE 1-3

PRESSURE COEFFICIENT DATA, MCA STATOR B 50% DESIGN SPEED, POINT 3

% Chord	C_p 10% Span Suction Surface	C_p 10% Span Pressure Surface	S Factor 10% Span Suction Surface	S Factor 10% Span Pressure Surface	C_p 90% Span Pressure Surface	S Factor 90% Span Pressure Surface	% Chord	C_p 90% Span Suction Surface	S Factor 90% Span Suction Surface	% Chord	Hub/Mid Channel Ratio P/P_8
15	-0.576	0.346	1.609	0.686	0.271	0.786	19.2	-0.275	1.333	8.3	0.833
20	-0.496	0.266	1.529	0.766	0.180	0.877	22.6	-0.298	1.356	13.7	0.842
25	-0.376	0.266	1.409	0.766	0.294	0.763	24.7	-0.252	1.310	18.6	0.845
30	-0.456	0.226	1.489	0.806	0.294	0.763	27.9	-0.298	1.356	23.5	0.8[illegible]8
35	-0.335	0.346	1.368	0.686	0.408	0.649	30.3	-0.230	1.287	33.9	0.863
40	-0.456	0.266	1.489	0.766	0.408	0.649	33.6	-0.275	1.333	45.2	0.867
45	-0.416	0.426	1.449	0.606	0.499	0.558	35.8	-0.184	1.242	57.7	0.888
50	-0.576	0.386	1.609	0.646	0.553	0.604	39.4	-0.298	1.356	70.8	
60	-0.416	0.547	1.449	0.485	0.554	0.512	41.1	-0.184	1.242		
70	-0.376	0.547	1.409	0.485	0.567	0.490	51.5	-0.230	1.287		
							56.5	-0.70	1.128		
							61.2	-0.70	1.128		
							70.7	0.066	0.991		
							79.6	0.020	1.037		

TABLE 1-4

PRESSURE COEFFICIENT DATA, MCA STATOR B 50% DESIGN SPEED, POINT 4

% Chord	C_p 10% Span Suction Surface	C_p 10% Span Pressure Surface	S Factor 10% Span Suction Surface	S Factor 10% Span Pressure Surface	C_p 90% Span Pressure Surface	S Factor 90% Span Pressure Surface	% Chord	C_p 90% Span Suction Surface	S Factor 90% Span Suction Surface	% Chord	Hub/Mid Channel Ratio P/P_8
15	-0.821	0.419	1.851	0.610	0.309	0.747	19.2	-0.263	1.319	8.3	0.837
20	-0.607	0.333	1.637	0.696	0.217	0.839	22.6	-0.263	1.319	13.7	0.846
25	-0.479	0.290	1.509	0.739	0.332	0.724	24.7	-0.194	1.251	18.6	0.849
30	-0.479	0.419	1.509	0.610	0.332	0.724	27.9	-0.240	1.297	23.5	0.855
35	-0.350	0.333	1.380	0.696	0.423	0.633	30.3	-0.194	1.251	33.9	0.864
40	-0.436	0.462	1.466	0.568	0.423	0.633	33.6	-0.217	1.274	45.2	0.879
45	-0.350	0.462	1.380	0.568	0.515	0.541	35.8	-0.148	1.205	57.7	0.891
50	-0.479	0.590	1.509	0.439	0.469	0.587	39.4	-0.240	1.297	70.8	
60	-0.308	0.590	1.338	0.439	0.560	0.495	41.1	-0.125	1.182		
70	-0.308	0.590	1.338	0.439	0.652	0.404	51.5	-0.171	1.228		
							56.5	-0.011	1.068		
							61.2	0.011	1.045		
							70.7	0.103	0.953		
							79.6	-0.057	1.113		

TABLE 1-5

PRESSURE COEFFICIENT DATA, MCA STATOR B
50% DESIGN SPEED, POINT 5

% Chord	C_p 10% Span Suction Surface	C_p 10% Span Pressure Surface	S Factor 10% Span Suction Surface	S Factor 10% Span Pressure Surface	C_p 90% Span Pressure Surface	S Factor 90% Span Pressure Surface	% Chord	C_p 90% Span Suction Surface	S Factor 90% Span Suction Surface	% Chord	Hub/Mid Channel Ratio P/P_s
15	-0.808	0.441	1.839	0.589	0.385	0.674	19.2	-0.132	1.192	8.3	0.842
20	-0.651	0.402	1.682	0.628	0.320	0.739	22.6	-0.132	1.192	13.7	0.851
25	-0.534	0.363	1.565	0.667	0.406	0.653	24.7	-0.062	1.127	18.6	0.857
30	-0.417	0.285	1.448	0.745	0.406	0.653	27.9	-0.110	1.170	23.5	0.860
35	-0.339	0.363	1.370	0.667	0.471	0.588	30.3	-0.046	1.106	33.9	0.872
40	-0.339	0.363	1.370	0.667	0.471	0.588	33.6	-0.081	1.149	45.2	0.884
45	-0.183	0.441	1.214	0.589	0.579	0.480	35.8	-0.003	1.062	57.7	0.899
50	-0.183	0.441	1.214	0.589	0.536	0.523	39.4	-0.067	1.127	70.8	
60	-0.144	0.597	1.[illegible]	0.433	0.622	0.437	41.1	-0.003	1.062		
70	-0.144	0.558	1.1[illegible]5	0.472	0.622	0.437	51.5	-0.046	1.062		
							56.5	0.104	0.955		
							61.2	-0.061	0.998		
							70.7	0.191	0.868		
							79.6	-0.049	1.106		

TABLE 1-6

PRESSURE COEFFICIENT DATA, MCA STATOR B
50% DESIGN SPEED, POINT 6

% Chord	C_p 10% Span Suction Surface	C_p 10% Span Pressure Surface	S Factor 10% Span Suction Surface	S Factor 10% Span Pressure Surface	C_p 90% Span Pressure Surface	S Factor 90% Span Pressure Surface	% Chord	C_p 90% Span Suction Surface	S Factor 90% Span Suction Surface	% Chord	Hub/Mid Channel Ratio P/P_s
15	-0.828	0.346	1.859	0.685	0.326	0.730	19.2	-0.185	1.242	8.3	0.842
20	-0.787	0.184	1.819	0.847	0.259	0.797	22.6	-0.229	1.286	13.7	0.848
25	-0.625	0.184	1.657	0.847	0.348	0.708	24.7	-0.140	1.197	18.6	0.857
30	-0.585	0.103	1.616	0.928	0.326	0.[illegible]30	27.9	-0.207	1.264	23.5	0.860
35	-0.504	0.143	1.535	0.887	0.437	0.619	30.3	-0.118	1.175	33.9	0.869
40	-0.504	0.143	1.535	0.887	0.415	0.641	33.6	-0.185	1.242	45.2	0.881
45	-0.423	0.224	1.454	0.806	0.526	0.530	35.8	-0.073	1.131	57.7	0.893
50	-0.382	0.305	1.414	0.725	0.482	0.574	39.4	-0.162	1.220	70.8	0.893
60	-0.301	0.386	1.333	0.644	0.571	0.485	41.1	-0.051	1.108		
70	-0.261	0.386	1.292	0.644	0.526	0.530	51.5	-0.118	1.175		
							56.5	0.037	1.019		
							61.2	-0.051	1.108		
							70.7	0.126	0.930		
							79.6	-0.140	1.197		

TABLE 2-1

PRESSURE COEFFICIENT DATA, MCA STATOR B
70% DESIGN SPEED, POINT 1

% Chord	C_p 10% Span Suction Surface	C_p 10% Span Pressure Surface	S Factor 10% Span Suction Surface	S Factor 10% Span Pressure Surface	C_p 90% Span Pressure Surface	S Factor 90% Span Pressure Surface	% Chord	C_p 90% Span Suction Surface	S Factor 90% Span Suction Surface	% Chord	Hub/Mid Channel Ratio P/P_8
15	-0.313	0.124	1.392	0.954	0.153	0.983	19.2	-0.269	1.405	8.3	0.662
20	-0.349	0.051	1.428	1.027	0.107	1.028	22.6	-0.269	1.405	13.7	0.668
25	-0.331	0.106	1.410	0.972	0.222	0.914	24.7	-0.280	1.417	18.6	0.665
30	-0.422	0.069	1.501	1.009	0.256	0.880	27.9	-0.292	1.428	23.5	0.668
35	-0.440	0.179	1.519	0.900	0.336	0.800	30.3	-0.303	1.440	33.9	0.692
40	-0.550	0.160	1.629	0.918	0.359	0.777	33.6	-0.280	1.417	45.2	0.724
45	-0.605	0.343	1.683	0.735	0.450	0.685	35.8	-0.280	1.417	57.7	0.756
50	-0.769	0.361	1.848	0.717	0.450	0.685	39.4	-0.337	1.474	70.8	
60	-0.659	0.507	1.738	0.571	0.519	0.617	41.1	-0.303	1.440		
70	-0.513	0.507	1.592	0.571	0.519	0.617	51.5	-0.257	1.394		
							56.5	-0.132	1.268		
							6[illegible]	-0.075	1.211		
							70.7	-0.006	1.143		
							79.6	-0.017	1.154		

TABLE 2-2

PRESSURE COEFFICIENT DATA, MCA STATOR B
70% DESIGN SPEED, POINT 2

% Chord	C_p 10% Span Suction Surface	C_p 10% Span Pressure Surface	S Factor 10% Span Suction Surface	S Factor 10% Span Pressure Surface	C_p 90% Span Pressure Surface	S Factor 90% Span Pressure Surface	% Chord	C_p 90% Span Suction Surface	S Factor 90% Span Suction Surface	% Chord	Hub/Mid Channel Ratio P/P_8
15	-0.363	0.227	1.439	0.847	0.217	0.912	19.2	-0.244	1.375	8.3	0.677
20	-0.363	0.153	1.439	0.921	0.182	0.947	22.6	-0.233	1.363	13.7	0.692
25	-0.327	0.190	1.402	0.884	0.275	0.855	24.7	-0.244	1.375	18.6	0.692
30	-0.382	0.153	1.457	0.921	0.309	0.820	27.9	-0.233	1.363	23.5	0.697
35	-0.363	0.227	1.439	0.847	0.379	0.751	30.3	-0.233	1.363	33.9	0.720
40	-0.456	0.227	1.531	0.847	0.402	0.727	33.6	-0.233	1.363	45.2	0.749
45	-0.511	0.375	1.586	0.699	0.494	0.635	35.8	-0.210	1.340	57.7	0.775
50	-0.659	0.412	1.734	0.662	0.471	0.658	39.4	-0.233	1.363	70.8	
60	-0.548	0.541	1.623	0.533	0.552	0.577	41.1	-0.210	1.340		
70	-0.437	0.541	1.512	0.533	0.541	0.589	51.5	-0.162	1.294		
							56.5	-0.048	1.178		
							61.2	-0.013	1.144		
							70.7	0.032	1.097		
							79.6	0.025	1.155		

TABLE 2-3

PRESSURE COEFFICIENT DATA, MCA STATOR B
70% DESIGN SPEED, POINT 3

% Chord	C_p 10% Span Suction Surface	C_p 10% Span Pressure Surface	S Factor 10% Span Suction Surface	S Factor 10% Span Pressure Surface	C_p 90% Span Pressure Surface	S Factor 90% Span Pressure Surface	% Chord	C_p 90% Span Suction Surface	S Factor 90% Span Suction Surface	% Chord	Hub/Mid Channel Ratio P/P_s
15	-0.476	0.281	1.544	0.786	0.263	0.858	19.2	-0.221	1.344	8.3	0.695
20	-0.418	0.223	1.486	0.845	0.216	0.906	22.6	-0.221	1.344	13.7	[illegible]
25	-0.340	0.242	1.408	0.825	0.311	0.811	24.7	-0.210	1.332	18.6	0.715
30	-0.379	0.203	1.447	0.864	0.322	0.799	27.9	-0.210	1.332	23.5	0.723
35	-0.340	0.281	1.408	0.786	0.417	0.704	30.3	-0.186	1.308	33.9	0.743
40	-0.418	0.281	1.486	0.786	0.417	0.704	33.6	-0.198	1.320	45.2	0.771
45	-0.418	0.398	1.486	0.670	0.524	0.598	35.8	-0.150	1.273	57.7	0.794
50	-0.515	0.437	1.583	0.631	0.500	0.522	39.4	-0.198	1.320	70.8	
60	-0.418	0.553	1.486	0.514	0.583	0.539	41.1	-0.150	1.273		
70	-0.340	0.534	1.408	0.534	0.559	0.562	51.5	-0.127	1.249		
							56.5	0.003	1.119		
							61.2	0.003	1.119		
							70.7	0.097	1.024		
							79.6	-0.138	1.261		

TABLE 2-4

PRESSURE COEFFICIENT DATA, MCA STATOR B
70% DESIGN SPEED, POINT 4

% Chord	C_p 10% Span Suction Surface	C_p 10% Span Pressure Surface	S Factor 10% Span Suction Surface	S Factor 10% Span Pressure Surface	C_p 90% Span Pressure Surface	S Factor 90% Span Pressure Surface	% Chord	C_p 90% Span Suction Surface	S Factor 90% Span Suction Surface	% Chord	Hub/Mid Channel Ratio P/P_s
15	-0.713	0.388	.776	0.675	0.317	0.801	19.2	-0.193	1.312	8.3	0.706
20	-0.509	0.326	1.572	0.736	0.257	0.860	22.6	-0.205	1.324	13.7	0.726
25	-0.386	0.326	1.450	0.736	0.364	0.753	24.7	-0.158	1.276	18.6	0.734
30	-0.345	0.286	1.409	0.777	0.364	0.753	27.9	-0.170	1.288	23.5	0.742
35	-0.284	0.367	1.348	0.695	0.460	0.658	30.3	-0.134	1.253	33.9	0.762
40	-0.325	0.367	1.388	0.695	0.448	0.670	33.6	-0.158	1.276	45.2	0.787
45	-0.284	0.449	1.348	0.614	0.543	0.575	35.8	-0.086	1.205	57.7	0.809
50	-0.345	0.490	1.409	0.573	0.519	0.599	39.4	-0.122	1.241	70.8	
60	-0.244	0.571	1.307	0.491	0.614	0.504	41.1	-0.074	1.193		
70	-0.162	0.571	1.246	0.491	0.590	0.528	51.5	-0.051	1.169		
							56.5	0.067	1.051		
							61.2	0.067	1.051		
							70.7	0.139	0.979		
							79.6	0.043	1.074		

TABLE 2-5

PRESSURE COEFFICIENT DATA, MCA STATOR B
70% DESIGN SPEED, POINT 5

% Chord	C_p 10% Span Suction Surface	C_p 10% Span Pressure Surface	S Factor 10% Span Suction Surface	S Factor 10% Span Pressure Surface	C_p 90% Span Pressure Surface	S Factor 90% Span Pressure Surface	% Chord	C_p 90% Span Suction Surface	S Factor 90% Span Suction Surface	% Chord	Hub/Mid Channel Ratio P/P_s
15	-0.856	0.419	1.917	0.640	0.347	0.769	19.2	-0.158	1.275	8.3	0.714
20	-0.753	0.337	1.793	0.722	0.300	0.816	22.6	-0.193	1.311	13.7	0.736
25	-0.568	0.316	1.628	0.743	0.383	0.734	24.7	-0.134	1.252	18.6	0.744
30	-0.465	0.275	1.525	0.784	0.395	0.722	27.9	-0.146	1.264	23.5	0.752
35	-0.383	0.337	1.443	0.722	0.477	0.640	30.3	-0.087	1.205	33.9	0.771
40	-0.321	0.337	1.381	0.722	0.477	0.640	33.6	-0.122	1.240	45.2	0.796
45	-0.259	0.410	1.319	0.640	0.571	0.546	35.8	-0.040	1.158	57.7	0.815
50	-0.239	0.461	1.299	0.599	0.548	0.569	39.4	-0.087	1.205	70.8	
60	-0.156	0.564	1.216	0.496	0.618	0.499	41.1	-0.028	1.146		
70	-0.115	0.543	1.175	0.516	0.595	0.522	51.5	-0.016	1.134		
							56.5	0.089	1.028		
							61.2	0.077	1.040		
							70.7	0.159	0.958		
							79.6	-0.016	1.134		

TABLE 2-6

PRESSURE COEFFICIENT DATA, MCA STATOR B
70% DESIGN SPEED, POINT 6

% Chord	C_p 10% Span Suction Surface	C_p 10% Span Pressure Surface	S Factor 10% Span Suction Surface	S Factor 10% Span Pressure Surface	C_p 90% Span Pressure Surface	S Factor 90% Span Pressure Surface	% Chord	C_p 90% Span Suction Surface	S Factor 90% Span Suction Surface	% Chord	Hub/Mid Channel Ratio P/P_s
15	-0.867	0.320	1.923	0.735	0.433	0.675	19.2	-0.262	1.372	8.3	0.717
20	-0.803	0.172	1.860	0.883	0.128	0.981	22.6	-0.274	1.384	13.7	0.733
25	-0.[illegible]	0.193	1.753	0.862	0.458	0.651	24.7	-0.189	1.299	18.6	0.741
30	-0.634	0.172	1.690	0.883	0.458	0.651	27.9	-0.226	1.335	23.5	0.752
35	-0.549	0.172	1.605	0.383	0.433	0.675	30.3	-0.152	1.262	33.9	0.744
40	-0.506	0.172	1.562	0.883	0.433	0.675	33.6	-0.189	1.299	45.2	0.790
45	-0.443	0.278	1.499	0.777	0.531	0.578	35.8	-0.103	1.213	57.7	0.809
50	-0.400	0.320	1.456	0.735	0.507	0.602	39.4	-0.177	1.287	70.8	0.806
60	-0.294	0.405	1.350	0.650	0.580	0.529	41.1	-0.091	1.201		
70	-0.252	0.405	1.308	0.650	0.556	0.553	51.5	-0.103	1.213		
							56.5	0.018	1.091		
							61.2	-0.018	1.128		
							70.7	0.178	0.981		
							79.6	0.018	1.091		

TABLE 3-1

PRESSURE COEFFICIENT DATA, MCA STATOR B
90% DESIGN SPEED, POINT 1

% Chord	C_p 10% Span Suction Surface	C_p 10% Span Pressure Surface	S Factor 10% Span Suction Surface	S Factor 10% Span Pressure Surface	C_p 90% Span Pressure Surface	S Factor 90% Span Pressure Surface	% Chord	C_p 90% Span Suction Surface	S Factor 90% Span Suction Surface	% Chord	Hub/Mid Channel Ratio P/P_s
15	-0.346	-0.015	1.485	1.154	0.097	1.132	19.2	-0.391	1.621	8.3	0.503
20	-0.346	-0.126	1.485	1.265	-0.044	1.274	22.6	-0.265	1.495	13.7	0.503
25	-0.402	-0.093	1.540	1.231	0.137	1.093	24.7	-0.383	1.613	18.6	0.482
30	-0.457	-0.104	1.596	1.242	0.215	1.014	27.9	-0.217	1.448	23.5	0.465
35	-0.512	0.028	1.651	1.110	0.294	0.935	30.3	-0.257	1.487	33.9	0.533
40	-0.578	0.028	1.717	1.110	0.342	0.888	33.6	-0.336	1.566	45.2	0.584
45	-0.766	0.248	1.904	0.889	0.428	0.801	35.8	-0.320	1.550	57.7	0.622
50	-0.953	0.282	2.092	0.856	0.444	0.785	39.4	-0.580	1.810	70.8	
60		0.237		0.900	0.507	0.722	41.1	-0.493	1.724		
70	-0.567	0.248	1.706	0.889	0.515	0.714	51.5	-0.241	1.471		
							56.5	-0.083	1.314		
							61.2	-0.083	1.314		
							70.7	-0.052	1.282		
							79.6	-0.107	1.337		

TABLE 3-2

PRESSURE COEFFICIENT DATA, MCA STATOR B
90% DESIGN SPEED, POINT 2

% Chord	C_p 10% Span Suction Surface	C_p 10% Span Pressure Surface	S Factor 10% Span Suction Surface	S Factor 10% Span Pressure Surface	C_p 90% Span Pressure Surface	S Factor 90% Span Pressure Surface	% Chord	C_p 90% Span Suction Surface	S Factor 90% Span Suction Surface	% Chord	Hub/Mid Channel Ratio P/P_s
15	-0.707	-0.322	1.845	1.479	-0.110	1.338	19.2	-0.563	1.790	8.3	0.437
20	-0.726	-0.406	1.863	1.544	-0.124	1.352	22.6	-0.374	1.601	13.7	0.446
25	-0.707	-0.359	1.845	1.497	-0.050	1.277	24.7	-0.434	1.652	18.6	0.442
30	-0.773	-0.397	1.911	1.534	0.005	1.223	27.9	-0.434	1.662	23.5	0.446
35	-0.764	-0.284	1.901	1.421	0.064	1.163	30.3	-0.455	1.682	33.9	0.488
40	-0.848	-0.293	1.986	1.431	0.105	1.122	33.6	-0.455	1.682	45.2	0.527
45	-0.905	-0.124	2.042	1.261	0.159	1.068	35.8	-0.455	1.682	57.7	0.557
50	-1.074	-0.096	2.212	1.233	0.179	1.048	39.4	-0.414	1.642	70.8	
60	-0.924	0.016	2.061	1.120	0.226	1.001	41.1	-0.461	1.689		
70	-0.745	0.025	1.882	1.111	0.240	0.987	51.5	-0.313	1.541		
							56.5	-0.252	1.480		
							61.2	-0.225	1.453		
							70.7	-0.218	1.446		
							79.6	-0.225	1.453		

TABLE 3-3

PRESSURE COEFFICIENT DATA, MCA STATOR B
90% DESIGN SPEED, POINT 3

% Chord	C_p 10% Span Suction Surface	C_p 10% Span Pressure Surface	S Factor 10% Span Suction Surface	S Factor 10% Span Pressure Surface	C_p 90% Span Pressure Surface	S Factor 90% Span Pressure Surface	% Chord	C_p 90% Span Suction Surface	S Factor 90% Span Suction Surface	% Chord	Hub/Mid Channel Ratio P/P_s
15	-0.786	-0.094	1.917	1.225	0.103	1.108	19.2	-0.308	1.520	8.3	0.498
20	-0.682	-0.123	1.812	1.253	0.054	1.157	22.6	-0.301	1.513	13.7	0.523
25	-0.568	-0.094	1.699	1.225	0.152	1.059	24.7	-0.280	1.492	18.6	0.535
30	-0.578	-0.132	1.708	1.263	0.152	1.059	27.9	-0.294	1.506	23.5	0.546
35	-0.530	-0.047	1.661	1.177	0.243	0.969	30.3	-0.259	1.471	33.9	0.576
40	-0.587	-0.056	1.718	1.187	0.312	0.899	33.6	-0.280	1.492	45.2	0.606
45	-0.578	0.056	1.708	1.073	0.326	0.885	35.8	-0.224	1.436	57.7	0.634
50	-0.663	0.085	1.799	1.045	0.312	0.899	39.4	-0.231	1.443	70.8	
60	-0.559	0.180	1.689	0.950	0.382	0.829	41.1	-0.203	1.415		
70	-0.473	0.047	1.604	1.083	0.368	0.843	51.5	-0.161	1.373		
							56.5	-0.056	1.269		
							61.2	-0.077	1.289		
							70.7	-0.084	1.296		
							79.6	-0.084	1.289		

TABLE 3-4

PRESSURE COEFFICIENT DATA, MCA STATOR B
90% DESIGN SPEED, POINT 4

% Chord	C_p 10% Span Suction Surface	C_p 10% Span Pressure Surface	S Factor 10% Span Suction Surface	S Factor 10% Span Pressure Surface	C_p 90% Span Pressure Surface	S Factor 90% Span Pressure Surface	% Chord	C_p 90% Span Suction Surface	S Factor 90% Span Suction Surface	% Chord	Hub/Mid Channel Ratio P/P_s
15	-0.686	0.396	1.810	0.727	0.429	0.779	19.2	-0.089	1.298	8.3	0.600
20	-0.525	0.332	1.649	0.792	0.367	0.841	22.6	-0.058	1.267	13.7	0.626
25	-0.332	0.343	1.456	0.781	0.467	0.740	24.7	-0.051	1.259	18.6	0.641
30	-0.278	0.300	1.403	0.824	0.475	0.732	27.9	-0.027	1.236	23.5	0.653
35	-0.182	0.375	1.306	0.749	0.405	0.802	30.3	0.003	1.205	33.9	0.681
40	-0.192	0.386	1.317	0.738	0.545	0.663	33.6	0.003	1.205	45.2	0.709
45	-0.149	0.482	1.274	0.641	0.645	0.562	35.8	0.072	1.135	57.7	0.735
50	-0.182	0.514	1.306	0.609	0.614	0.593	39.4	0.080	1.127	70.8	
60	-0.128	0.600	1.253	0.524	0.700	0.508	41.1	0.096	1.112		
70	-0.053	0.622	1.178	0.502	0.669	0.539	51.5	0.150	1.058		
							56.5	0.235	0.972		
							61.2	0.220	0.988		
							70.7	0.274	0.934		
							79.6	0.212	0.996		

TABLE 3-5

PRESSURE COEFFICIENT DATA, MCA STATOR B
90% DESIGN SPEED, POINT

% Chord	C_p 10% Span Suction Surface	C_p 10% Span Pressure Surface	S Factor 10% Span Suction Surface	S Factor 10% Span Pressure Surface	C_p 90% Span Pressure Surface	S Factor 90% Span Pressure Surface	% Chord	C_p 90% Span Suction Surface	S Factor 90% Span Suction Surface	% Chord	Hub/Mid Channel Ratio P/P_s
15	-0.836	0.388	1.949	0.725	0.418	0.783	19.2	-0.122	1.323	8.3	0.603
20	-0.654	0.320	1.768	0.793	0.379	0.822	22.6	-0.075	1.277	13.7	0.633
25	-0.473	0.320	1.586	0.793	0.456	0.745	24.7	-0.052	1.254	18.6	0.648
30	-0.394	0.274	1.507	0.838	0.479	0.721	27.9	-0.044	1.246	23.5	0.663
35	-0.292	0.376	1.405	0.736	0.549	0.652	30.3	0.024	1.177	33.9	0.688
40	-0.246	0.365	1.359	0.747	0.549	0.652	33.6	0.001	1.200	45.2	0.710
45	-0.201	0.478	1.314	0.634	0.626	0.575	35.8	0.086	1.115	57.7	0.735
50	-0.212	0.501	1.325	0.611	0.618	0.582	39.4	0.086	1.115	70.8	
60	-0.121	0.592	1.235	0.520	0.688	0.513	41.1	0.124	1.076		
70	-0.087	0.603	1.201	0.509	0.657	0.544	51.5	0.148	1.053		
							56.5	0.240	0.961		
							61.2	0.186	1.015		
							70.7	0.271	0.930		
							79.6	0.202	0.999		

TABLE 3-6

PRESSURE COEFFICIENT DATA, MCA STATOR B
90% DESIGN SPEED, POINT 6

% Chord	C_p 10% Span Suction Surface	C_p 10% Span Pressure Surface	S Factor 10% Span Suction Surface	S Factor 10% Span Pressure Surface	C_p 90% Span Pressure Surface	S Factor 90% Span Pressure Surface	% Chord	C_p 90% Span Suction Surface	S Factor 90% Span Suction Surface	% Chord	Hub/Mid Channel Ratio P/P_s
15	-0.883	0.421	1.987	0.681	0.395	0.798	19.2	-0.191	1.385	8.3	0.606
20	-0.704	0.362	1.807	0.741	0.410	0.783	22.6	-0.130	1.324	13.7	0.633
25	-0.560	0.290	1.664	0.813	0.426	0.767	24.7	-0.099	1.293	18.6	0.648
30	-0.464	0.278	1.568	0.825	0.426	0.767	27.9	-0.099	1.293	23.5	0.665
35	-0.392	0.326	1.496	0.777	0.518	0.675	30.3	-0.021	1.215	33.9	0.689
40	-0.320	0.314	1.424	0.789	0.441	0.752	33.6	-0.060	1.254	45.2	0.714
45	-0.260	0.421	1.364	0.681	0.433	0.760	35.8	0.055	1.138	57.7	
50	-0.237	0.433	1.340	0.669	0.603	0.590	39.4	0.016	1.177	70.8	
60	0.146	0.541	0.957	0.561	0.572	0.621	41.1	0.093	1.100		
70	-0.105	0.553	1.208	0.549	0.657	0.536	51.5	0.086	1.107		
							56.5	0.202	0.991		
							61.2	0.117	1.076		
							70.7	0.248	0.945		
							79.6	0.140	1.053		

TABLE 3-7

PRESSURE COEFFICIENT DATA, MCA STATOR B
90% DESIGN SPEED, POINT 7

% Chord	C_p 10% Span		S Factor 10% Span		C_p 90% Span	S Factor 90% Span	% Chord	C_p 90% Span	S Factor 90% Span	% Chord	Hub/Mid Channel Ratio
	Suction Surface	Pressure Surface	Suction Surface	Pressure Surface	Pressure Surface	Pressure Surface		Suction Surface	Suction Surface		P/P_s
15	-0.871	0.325	1.969	0.773	0.370	0.819	19.2	-0.192	1.383	8.3	0.606
20	-0.686	0.251	1.784	0.847	0.278	0.912	22.6	-0.169	1.360	13.7	0.630
25	-0.612	0.226	1.710	0.871	0.417	0.773	24.7	-0.108	1.298	18.6	0.647
30	-0.501	0.152	1.599	0.945	0.409	0.781	27.9	-0.138	1.329	23.5	0.661
35	-0.464	0.263	1.562	0.834	0.509	0.663	30.3	-0.038	1.229	33.9	0.685
40	-0.377	0.251	1.476	0.847	0.486	0.704	33.6	-0.115	1.306	45.2	0.712
45	-0.328	0.374	1.426	0.723	0.594	0.596	35.8	0.108	1.082	57.7	0.736
50	-0.279	0.399	1.377	0.698	0.563	0.626	39.4	-0.07[illegible]	1.267	70.8	0.729
60	0.053	0.510	1.044	0.587	0.641	0.549	41.1	0.061	1.128		
70	-0.143	0.485	1.241	0.612	0.510	0.580	51.5	0.000	1.190		
							56.5	0.177	1.013		
							61.2	0.077	1.113		
							70.7	0.231	0.959		
							79.6	0.131	1.059		

TABLE 4-1

PRESSURE COEFFICIENT DATA, MCA STATOR B
100% DESIGN SPEED, POINT 1

% Chord	C_p 10% Span Suction Surface	C_p 10% Span Pressure Surface	S Factor 10% Span Suction Surface	S Factor 10% Span Pressure Surface	C_p 90% Span Pressure Surface	S Factor 90% Span Pressure Surface	% Chord	C_p 90% Span Suction Surface	S Factor 90% Span Suction Surface	% Chord	Hub/Mid Channel Ratio P/P_s
15	-0.429	-0.002	1.600	1.174	-0.338	1.606	19.2	-0.381	1.649	8.3	0.449
20	-0.253	-0.095	1.424	1.267	-0.316	1.585	22.6	-0.461	1.729	13.7	0.452
25	-0.299	-0.206	1.471	1.378	0.059	1.209	24.7	-0.490	1.758	18.6	0.423
30	-0.345	-0.141	1.517	1.313	-0.157	1.425	27.9	-0.533	1.801	23.5	0.378
35		-0.114		1.285	0.240	1.028	30.3	-0.562	1.830	33.9	0.394
40	-0.429	-0.067	1.600	1.[illegible]39	0.312	0.955	33.6	-0.627	1.895	45.2	0.500
45	-0.642	0.182	1.813	0.989	0.384	0.883	35.8	-0.497	1.756	57.7	0.544
50	-0.762	0.256	1.934	0.915	0.406	0.861	39.4	-0.432	1.700	70.8	0.735
60	-1.087	0.395	2.258	0.776	0.529	0.738	41.1	-0.439	1.707		
70	-0.642	0.404	1.813	0.766	0.493	0.[illegible]74	51.5	-0.302	1.570		
							56.5	-0.208	1.476		
							61.2	-0.222	1.490		
							70.7	-0.179	1.447		
							79.6	-0.222	1.490		

TABLE 4-2

PRESSURE COEFFICIENT DATA, MCA STATOR B
100% DESIGN SPEED, POINT 2

% Chord	C_p 10% Span Suction Surface	C_p 10% Span Pressure Surface	S Factor 10% Span Suction Surface	S Factor 10% Span Pressure Surface	C_p 90% Span Pressure Surface	S Factor 90% Span Pressure Surface	% Chord	C_p 90% Span Suction Surface	S Factor 90% Span Suction Surface	% Chord	Hub/Mid Channel Ratio P/P_s
15		0.193		0.981	0.370	0.897	19.2	-0.328	1.596	8.3	0.507
20	-0.266	0.193	1.442	0.981	0.308	0.960	22.6	-0.252	1.520	13.7	0.540
25	-0.249	0.151	1.425	1.024	0.398	0.870	24.7	-0.024	1.292	18.6	0.557
30	-0.224	0.202	1.399	0.973	0.425	0.842	27.9	0.017	1.250	23.5	0.572
35	-0.232	0.245	1.408	0.930	0.487	0.780	30.3	0.065	1.202	33.9	0.595
40	-0.232	0.466	1.408	0.708	0.515	0.752	33.6	0.052	1.216	45.2	0.618
45	-0.386	0.42[illegible]	1.561	0.751	0.591	0.676	35.8	0.107	1.160	57.7	0.641
50	-0.437	0.483	1.613	0.692	0.591	0.676	39.4	0.093	1.174	70.8	0.707
60		0.586		0.589	0.653	0.614	41.1	0.100	1.167		
70	-0.147	0.603	1.322	0.572	0.640	0.628	51.5	0.121	1.147		
							56.5	0.162	1.106		
							61.2	0.135	1.133		
							70.7	0.197	1.071		
							79.6	0.135	1.133		

TABLE 4-3

PRESSURE COEFFICIENT DATA, MCA STATOR B
100% DESIGN SPEED, POINT 3

% Chord	C_p 10% Span Suction Surface	C_p 10% Span Pressure Surface	S Factor 10% Span Suction Surface	S Factor 10% Span Pressure Surface	C_p 90% Span Pressure Surface	S Factor 90% Span Pressure Surface	% Chord	C_p 90% Span Suction Surface	S Factor 90% Span Suction Surface	% Chord	Hub/Mid Channel Ratio P/P_8
15	-0.721	0.387	1.890	0.780	0.458	0.787	19.2	-0.028	1.274	8.3	0.595
20	-0.605	0.287	1.77[illegible]	0.880	0.352	0.892	22.6	-0.050	1.295	13.7	0.617
25	-0.404	0.329	1.578	0.839	0.465	0.780	24.7	0.055	1.189	18.6	0.632
30	-0.329	0.262	1.[illegible]3	0.905	0.451	0.794	27.9	0.055	1.189	23.5	0.639
35	-0.196	0.379	1.364	0.789	0.528	0.716	30.3	0.133	1.112	33.9	0.649
40	-0.213	0.370	1.381	0.797	0.528	0.716	33.6	0.091	1.154	45.2	0.659
45	-0.137	0.495	1.306	0.672	0.620	0.624	35.8	0.197	1.048	57.7	0.672
50	-0.204	0.512	1.373	0.655	0.592	0.653	39.4	0.140	1.105	70.8	0.749
60	-0.112	0.629	1.281	0.538	0.663	0.582	41.1	0.140	1.105		
70	-0.054	0.612	1.223	0.555	0.648	0.596	51.5	0.182	1.062		
							56.5	0.239	1.006		
							61.2	0.175	1.069		
							70.7	0.274	0.970		
							79.6	0.246	0.999		

TABLE 4-4

PRESSURE COEFFICIENT DATA, MCA STATOR B
100% DESIGN SPEED, POINT 4

% Chord	C_p 10% Span Suction Surface	C_p 10% Span Pressure Surface	S Factor 10% Span Suction Surface	S Factor 10% Span Pressure Surface	C_p 90% Span Pressure Surface	S Factor 90% Span Pressure Surface	% Chord	C_p 90% Span Suction Surface	S Factor 90% Span Suction Surface	% Chord	Hub/Mid Channel Ratio P/P_8
15	-0.729	0.470	1.884	0.684	0.514	0.737	192	-0.087	1.339	8.3	0.592
20	-0.563	0.391	1.718	0.763	0.398	0.853	22.6	-0.005	1.257	13.7	0.639
25	-0.449	0.391	1.604	0.763	0.507	0.744	24.7	0.049	1.202	18.6	0.649
30	-0.326	0.339	1.481	0.815	0.500	0.751	27.9	0.090	1.161	23.5	0.656
35	-0.238	0.435	1.394	0.719	0.432	0.819	30.3	0.179	1.072	33.9	0.668
40	-0.168	0.426	1.323	0.728	0.569	0.682	33.6	0.131	1.120	45.2	0.673
45	-0.107	0.549	1.262	0.605	0.370	0.881	35.8	0.261	0.990	57.7	0.678
50	-0.089	0.575	1.245	0.579	0.623	0.628	39.4	0.234	1.018	70.8	0.731
60	-0.011	0.663	1.166	0.491	0.685	0.566	41.1	0.281	0.970		
70	0.041	0.672	1.113	0.482	0.678	0.573	51.5	0.179	1.072		
							56.5	0.302	0.949		
							61.2	0.227	1.024		
							70.7	0.329	0.922		
							79.6	0.220	1.031		

TABLE 4-5

PRESSURE COEFFICIENT DATA, MCA STATOR B
100% DESIGN SPEED, POINT 5

% Chord	C_p 10% Span Suction Surface	C_p 10% Span Pressure Surface	S Factor 10% Span Suction Surface	S Factor 10% Span Pressure Surface	C_p 90% Span Pressure Surface	S Factor 90% Span Pressure Surface	% Chord	C_p 90% Span Suction Surface	S Factor 90% Span Suction Surface	% Chord	Hub/Mid Channel Ratio P/P_8
15	-0.710	0.351	1.857	0.796	0.319	0.926	192	-0.141	1.387	8.3	0.608
20	-0.625	0.223	1.772	0.923	0.332	0.913	22.6	-0.167	1.413	13.7	0.629
25	-0.565	0.249	1.713	0.898	0.443	0.802	24.7	-0.011	1.257	18.6	0.640
30	-0.455	0.164	1.602	0.983	0.430	0.815	27.9	-0.017	1.263	23.5	0.650
35	-0.412	0.274	1.560	0.872	0.501	0.744	30.3	0.111	1.133	33.9	0.654
40	-0.328	0.266	1.475	0.881	0.508	0.737	33.6	0.033	1.211	45.2	0.659
45	-0.294	0.385	1.441	0.762	0.566	0.679	35.8	0.202	1.042	57.7	0.668
50	-0.217	0.393	1.365	0.753	0.579	0.666	39.4	0.072	1.172	70.8	0.693
60	-0.158	0.515	1.305	0.634	0.605	0.640	41.1	0.202	1.042		
70	-0.081	0.487	1.229	0.660	0.624	0.620	51.5	0.105	1.140		
							56.5	0.248	0.997		
							61.2	0.131	1.114		
							70.7	0.274	0.971		
							79.6	0.163	1.081		

TABLE 4-6

PRESSURE COEFFICIENT DATA, MCA STATOR B
100% DESIGN SPEED, POINT 6

% Chord	C_p 10% Span Suction Surface	C_p 10% Span Pressure Surface	S Factor 10% Span Suction Surface	S Factor 10% Span Pressure Surface	C_p 90% Span Pressure Surface	S Factor 90% Span Pressure Surface	% Chord	C_p 90% Span Suction Surface	S Factor 90% Span Suction Surface	% Chord	Hub/Mid Channel Ratio P/P_8
15	-0.686	0.359	1.833	0.787	0.452	0.799	192	-0.101	1.354	8.3	0.579
20	-0.617	0.255	1.764	0.891	0.545	0.910	22.6	-0.362	1.614	13.7	0.600
25	-0.539	0.247	1.686	0.859	0.478	0.773	24.7	-0.023	1.275	18.6	0.684
30	-0.452	0.178	1.600	0.969	0.458	0.793	27.9	-0.056	1.308	23.5	0.626
35	-0.401	0.255	1.548	0.891	0.563	0.689	30.3	0.061	1.191	33.9	0.653
40	-0.323	0.255	1.470	0.891	0.556	0.695	33.6	0.028	1.223	45.2	0.674
45	-0.280	0.368	1.427	0.778	0.647	0.604	35.8	0.139	1.112	57.7	0.695
50	-0.219	0.385	1.366	0.761	0.621	0.630	39.4	0.061	1.191	70.8	0.693
60	-0.141	0.497	1.288	0.649	0.693	0.558	41.1	0.185	1.067		
70	-0.081	0.480	1.228	0.666	0.680	0.571	51.5	0.106	1.145		
							56.5	0.276	0.975		
							61.2	0.158	1.093		
							70.7	0.315	0.936		
							79.6	0.165	1.086		

TABLE 5-1

PRESSURE COEFFICIENT DATA, MCA STATOR B 110% DESIGN SPEED, POINT 1

% Chord	C_p 10% Span Suction Surface	C_p 10% Span Pressure Surface	S Factor 10% Span Suction Surface	S Factor 10% Span Pressure Surface	C_p 90% Span Pressure Surface	S Factor 90% Span Pressure Surface	% Chord	C_p 90% Span Suction Surface	S Factor 90% Span Suction Surface	% Chord	Hub/Mid Channel Ratio P/P_s
15	-0.866	0.141	2.069	1.091	-0.301	1.614	19.2	-0.404	1.717	8.3	0.385
20	-0.654	0.030	1.857	1.213	-0.243	1.557	22.6	-0.410	1.723	13.7	0.400
25	-0.740	-0.050	1.943	1.284	-0.211	1.525	24.7	-0.461	1.775	18.6	0.385
30	-0.183	-0.100	1.336	1.342	-0.218	1.531	27.9	-0.455	1.768	23.5	0.348
35	-0.230	-0.110	1.433	1.356	-0.449	1.762	30.3	-0.519	1.833	33.9	0.306
40	-0.144	-0.050	1.347	1.306	0.135	1.178	33.6	-0.538	1.852	45.2	0.440
45	-0.411	0.227	1.614	1.012	0.405	0.909	35.8	-0.564	1.877	57.7	
50	-0.552	0.290	1.755	0.941	0.398	0.915	39.4	-0.506	1.820	70.8	0.750
60	-0.866	0.467	2.069	0.734	0.514	0.800	41.1	-0.577	1.890		
70	-0.646	0.460	1.849	0.742	0.508	0.806	51.5	-0.333	1.646		
							56.5	-0.211	1.525		
							61.2	-0.269	1.582		
							70.7	-0.166	1.480		
							79.6	-0.250	1.563		

TABLE 5-2

PRESSURE COEFFICIENT DATA, MCA STATOR B 110% DESIGN SPEED, POINT 2

% Chord	C_p 10% Span Suction Surface	C_p 10% Span Pressure Surface	S Factor 10% Span Suction Surface	S Factor 10% Span Pressure Surface	C_p 90% Span Pressure Surface	S Factor 90% Span Pressure Surface	% Chord	C_p 90% Span Suction Surface	S Factor 90% Span Suction Surface	% Chord	Hub/Mid Channel Ratio P/P_s
15	-0.914	0.377	2.127	0.835	0.414	0.869	19.2	-0.241	1.525	8.3	0.526
20	-0.870	0.246	2.084	0.936	0.303	0.980	22.6	-0.545	1.828	13.7	0.551
25	-0.340	0.326	1.554	0.886	0.386	0.897	24.7	-0.055	1.338	18.6	0.564
30	-0.246	0.254	1.460	0.959	0.393	0.890	27.9	-0.386	1.670	23.5	0.572
35	-0.101	0.363	1.314	0.850	0.462	0.821	30.3	0.110	1.173	33.9	0.577
40	-0.144	0.355	1.358	0.857	0.490	0.793	33.6	-0.068	1.352	45.2	0.587
45	-0.159	0.537	1.373	0.676	0.559	0.724	35.8	0.145	1.138	57.7	0.595
50	-0.362	0.544	1.576	0.669	0.566	0.717	39.4	0.069	1.214	70.8	0.769
60	-0.232	0.689	1.445	0.523	0.628	0.655	41.1	0.117	1.166		
70	-0.065	0.653	1.278	0.560	0.648	0.634	51.5	0.082	1.200		
							56.5	0.138	1.145		
							61.2	0.117	1.166		
							70.7	0.165	1.118		
							79.6	0.151	1.131		

TABLE 5-3

PRESSURE COEFFICIENT DATA, MCA STATOR B
110% DESIGN SPEED, POINT 3

% Chord	C_p 10% Span Suction Surface	C_p 10% Span Pressure Surface	S Factor 10% Span Suction Surface	S Factor 10% Span Pressure Surface	C_p 90% Span Pressure Surface	S Factor 90% Span Pressure Surface	% Chord	C_p 90% Span Suction Surface	S Factor 90% Span Suction Surface	% Chord	Hub/Mid Channel Ratio P/P_s
15	-0.723	0.425	1.930	0.782	0.420	0.872	19.2	-0.176	1.468	8.3	0.540
20	-0.681	0.313	1.888	0.892	0.332	0.960	22.6	-0.232	1.524	13.7	0.562
25	-0.382	0.362	1.580	0.845	0.395	0.897	24.7	0.012	1.280	18.6	0.569
30	-0.299	0.286	1.506	0.921	0.401	0.891	27.9	0.000	1.292	23.5	0.574
35	-0.195	0.411	1.401	0.796	0.457	0.834	30.3	0.131	1.160	33.9	0.583
40	-0.139	0.404	1.345	0.803	0.470	0.822	33.6	0.094	1.198	45.2	0.590
45	-0.111	0.543	1.318	0.664	0.552	0.740	35.8	0.175	1.117	57.7	0.600
50	-0.195	0.564	1.401	0.643	0.533	0.759	39.4	0.106	1.186	70.8	0.727
60	-0.076	0.710	1.283	0.497	0.602	0.690	41.1	0.163	1.129		
70	-0.034	0.668	1.241	0.538	0.589	0.703	51.5	0.125	1.167		
							56.5	0.175	1.117		
							61.2	0.156	1.135		
							70.7	0.219	1.073		
							79.6	0.188	1.104		

TABLE 5-4

PRESSURE COEFFICIENT DATA, MCA STATOR B
110% DESIGN SPEED, POINT 4

% Chord	C_p 10% Span Suction Surface	C_p 10% Span Pressure Surface	S Factor 10% Span Suction Surface	S Factor 10% Span Pressure Surface	C_p 90% Span Pressure Surface	S Factor 90% Span Pressure Surface	% Chord	C_p 90% Span Suction Surface	S Factor 90% Span Suction Surface	% Chord	Hub/Mid Channel Ratio P/P_s
15	-0.665	0.384	1.857	0.807	0.393	0.884	19.2	-0.193	1.471	8.3	0.542
20	-0.603	0.273	1.794	0.918	0.308	0.970	22.6	-0.199	1.477	13.7	0.560
25	-0.519	0.280	1.711	0.911	0.357	0.921	24.7	-0.021	1.300	18.6	0.567
30	-0.478	0.196	1.669	0.994	0.375	0.903	27.9	-0.009	1.288	23.5	0.571
35	-0.380	0.300	1.572	0.890	0.424	0.854	30.3	0.112	1.165	33.9	0.578
40	-0.345	0.307	1.537	0.883	0.430	0.848	33.6	0.063	1.214	45.2	0.587
45	-0.255	0.440	1.447	0.751	0.516	0.762	35.8	0.149	1.129	57.7	0.594
50	-0.227	0.467	1.419	0.723	0.497	0.780	39.4	0.075	1.202	70.8	0.601
60	-0.109	0.579	1.301	0.612	0.571	0.707	41.1	0.124	1.153		
70	-0.060	0.572	1.252	0.61[illegible]	0.565	0.713	51.5	0.100	1.178		
							56.5	0.149	1.129		
							61.2	0.124	1.153		
							70.7	0.192	1.086		
							79.6	0.161	1.117		

TABLE 5-5

PRESSURE COEFFICIENT DATA, MCA STATOR B
110% DESIGN SPEED, POINT 5

% Chord	C_p 10% Span Suction Surface	C_p 10% Span Pressure Surface	S Factor 10% Span Suction Surface	S Factor 10% Span Pressure Surface	C_p 90% Span Pressure Surface	S Factor 90% Span Pressure Surface	% Chord	C_p 90% Span Suction Surface	S Factor 90% Span Suction Surface	% Chord	Hub/Mid Channel Ratio P/P_8
15	-0.649	0.390	1.825	0.786	0.395	0.893	19.2	-0.130	1.417	8.3	0.539
20	-0.635	0.244	1.810	0.932	0.347	0.940	22.6	-0.418	1.705	13.7	0.554
25	-0.525	0.236	1.701	0.939	0.371	0.916	24.7	0.024	1.264	18.6	0.563
30	-0.510	0.126	1.686	1.049	0.400	0.887	27.9	-0.135	1.423	23.5	0.499
35	-0.408	0.236	1.583	0.939	0.436	0.852	30.3	0.124	1.154	33.9	0.572
40	-0.342	0.229	1.518	0.947	0.477	0.811	33.6	0.006	1.282	45.2	0.583
45	-0.313	0.383	1.488	0.793	0.530	0.758	35.8	0.147	1.140	57.7	
50	-0.298	0.412	1.474	0.764	0.554	0.734	39.4	0.083	1.205	70.8	0.639
60	-0.188	0.544	1.364	0.632	0.589	0.699	41.1	0.130	1.158		
70	-0.144	0.522	1.320	0.654	0.618	0.669	51.5	0.077	1.211		
							56.5	0.147	1.140		
							61.2	0.094	1.193		
							70.7	0.189	1.099		
							79.6	0.159	1.128		

TABLE 5-6

PRESSURE COEFFICIENT DATA, MCA STATOR B
110% DESIGN SPEED, POINT 6

% Chord	C_p 10% Span Suction Surface	C_p 10% Span Pressure Surface	S Factor 10% Span Suction Surface	S Factor 10% Span Pressure Surface	C_p 90% Span Pressure Surface	S Factor 90% Span Pressure Surface	% Chord	C_p 90% Span Suction Surface	S Factor 90% Span Suction Surface	% Chord	Hub/Mid Channel Ratio P/P_8
15	-0.692	0.361	1.863	0.808	0.381	0.913	19.2	-0.131	1.425	8.3	0.530
20	-0.678	0.213	1.848	0.957	0.335	0.959	22.6	-0.413	1.707	13.7	0.546
25	-0.567	0.206	1.737	0.964	0.358	0.936	24.7	0.019	1.275	18.6	0.554
30	-0.552	0.904	1.722	1.076	0.387	0.907	27.9	-0.137	1.431	23.5	0.491
35	-0.488	0.206	1.618	0.964	0.421	0.873	30.3	0.116	1.177	33.9	0.563
40	-0.381	0.198	1.551	0.972	0.462	0.832	33.6	0.001	1.292	45.2	0.574
45	-0.352	0.354	1.522	0.816	0.513	0.780	35.8	0.139	1.154	57.7	
50	-0.337	0.384	1.507	0.786	0.536	0.757	39.4	0.076	1.218	70.8	0.659
60	-0.225	0.517	1.395	0.652	0.571	0.723	41.1	0.122	1.172		
70	-0.181	0.495	1.351	0.675	0.600	0.694	51.5	0.070	1.223		
							56.5	0.139	1.154		
							61.2	0.088	1.206		
							70.7	0.180	1.114		
							79.6	0.151	1.143		

TABLE 6-1

PRESSURE COEFFICIENT DATA, MCA STATOR B
120% DESIGN SPEED, POINT 1

% Chord	C_p 10% Span Suction Surface	C_p 10% Span Pressure Surface	S Factor 10% Span Suction Surface	S Factor 10% Span Pressure Surface	C_p 90% Span Pressure Surface	S Factor 90% Span Pressure Surface	% Chord	C_p 90% Span Suction Surface	S Factor 90% Span Suction Surface	% Chord	Hub/Mid Channel Ratio P/P_8
15	-0.888	0.098	2.097	1.111	-0.254	1.609	19.2	-0.446	1.801	8.3	0.328
20	-0.783	0.053	1.993	1.156	-0.219	1.574	22.6	-0.458	1.813	13.7	0.345
25	-0.850	-0.119	2.060	1.328	-0.196	1.551	24.7	-0.469	1.825	18.6	0.342
30	-0.559	-0.126	1.769	1.335	-0.201	1.557	27.9	-0.463	1.819	23.5	0.319
35	-0.641	-0.290	1.851	1.500	-0.219	1.574	30.3	-0.504	1.860	33.9	0.265
40	-0.343	-0.372	1.552	1.582	-0.149	1.505	33.6	-0.516	1.871	45.2	0.[illegible]49
45	-0.455	0.038	1.664	1.171	0.300	1.056	35.8	-0.551	1.906	57.7	0.410
50	-0.514	0.106	1.724	1.104	0.364	0.992	39.4	-0.580	1.936	70.8	
60	-0.791	0.412	2.000	0.798	0.498	0.858	41.1	-0.597	1.95[illegible]		
70	-1.082	0.457	2.291	0.753	0.544	0.811	51.5	-0.359	1.714		
							56.5	-0.283	1.638		
							61.2	-0.335	1.691		
							70.7	-0.[illegible]37	1.493		
							79.6	-0.306	1.662		

TABLE 6-2

PRESSURE COEFFICIENT DATA, MCA STATOR B
120% DESIGN SPEED, POINT 2

% Chord	C_p 10% Span Suction Surface	C_p 10% Span Pressure Surface	S Factor 10% Span Suction Surface	S Factor 10% Span Pressure Surface	C_p 90% Span Pressure Surface	S Factor 90% Span Pressure Surface	% Chord	C_p 90% Span Suction Surface	S Factor 90% Span Suction Surface	% Chord	Hub/Mid Channel Ratio P/P_8
15	-0.793	0.346	2.014	0.874	0.485	0.836	19.2	-0.611	1.933	8.3	0.474
20	-0.717	0.235	1.938	0.985	0.367	0.945	22.6	-0.611	1.933	13.7	0.534
25	-0.195	0.290	1.416	0.929	0.433	0.888	24.7	-0.515	1.837	18.6	0.558
30	-0.425	0.221	1.645	0.999	0.462	0.858	27.9	-0.376	1.697	23.5	0.569
35	-0.258	0.353	1.479	0.867	0.529	0.792	30.3	-0.118	1.440	33.9	0.582
40	-0.258	0.332	1.479	0.887	0.565	0.755	33.6	-0.074	1.396	45.2	0.587
45	-0.161	0.492	1.381	0.728	0.668	0.652	35.8	0.087	1.234	57.7	0.598
50	-0.237	0.506	1.458	0.714	0.668	0.652	39.4	0.028	1.293	70.8	
60	-0.126	0.631	1.346	0.588	0.742	0.579	41.1	0.[illegible]7	1.204		
70	-0.091	0.617	1.312	0.602	0.764	0.557	51.5	0.058	1.263		
							56.5	0.153	1.168		
							61.2	0.094	1.226		
							70.7	0.264	1.057		
							79.6	0.131	1.190		

TABLE 6-3

PRESSURE COEFFICIENT DATA, MCA STATOR B
120% DESIGN SPEED, POINT 3

% Chord	C_p 10% Span Suction Surface	C_p 10% Span Pressure Surface	S Factor 10% Span Suction Surface	S Factor 10% Span Pressure Surface	C_p 90% Span Pressure Surface	S Factor 90% Span Pressure Surface	% Chord	C_p 90% Span Suction Surface	S Factor 90% Span Suction Surface	% Chord	Hub/Mid Channel Ratio P/P_s
15	-0.800	0.3914	2.018	0.826	0.427	0.863	19.2	-0.531	1.820	8.3	0.519
20	-0.671	0.289	1.888	0.928	0.315	0.975	22.6	-0.372	1.662	13.7	0.543
25	-0.514	0.330	1.732	0.887	0.374	0.916	24.7	-0.293	1.583	18.6	0.553
30	-0.460	0.268	1.677	0.949	0.394	0.896	27.9	-0.135	1.424	23.5	0.558
35	-0.331	0.378	1.548	0.840	0.453	0.836	30.3	-0.003	1.292	33.9	0.566
40	-0.290	0.364	1.507	0.853	0.453	0.836	33.6	0.004	1.285	45.2	0.571
45	-0.181	0.514	1.398	0.704	0.559	0.731	35.8	0.103	1.186	57.7	0.578
50	-0.201	0.521	1.419	0.697	0.526	0.764	39.4	0.050	1.239	70.8	
60	-0.092	0.650	1.310	0.567	0.625	0.665	41.1	0.103	1.186		
70	-0.045	0.637	1.262	0.581	0.592	0.698	51.5	0.077	1.213		
							56.5	0.130	1.160		
							61.2	0.110	1.180		
							70.7	0.229	1.061		
							79.6	0.136	1.153		

TABLE 6-4

PRESSURE COEFFICIENT DATA, MCA STATOR B
120% DESIGN SPEED, POINT 4

% Chord	C_p 10% Span Suction Surface	C_p 10% Span Pressure Surface	S Factor 10% Span Suction Surface	S Factor 10% Span Pressure Surface	C_p 90% Span Pressure Surface	S Factor 90% Span Pressure Surface	% Chord	C_p 90% Span Suction Surface	S Factor 90% Span Suction Surface	% Chord	Hub/Mid Channel Ratio P/P_s
15	-0.609	0.450	1.827	0.766	0.482	0.833	19.2	-0.469	1.785	8.3	0.536
20	-0.583	0.344	1.800	0.873	0.384	0.931	22.6	-0.285	1.601	13.7	0.554
25	-0.449	0.350	1.667	0.866	0.423	0.892	24.7	-0.199	1.516	18.6	0.561
30	-0.449	0.290	1.667	0.926	0.450	0.866	27.9	-0.068	1.384	23.5	0.566
35	-0.323	0.384	1.540	0.833	0.666	0.649	30.3	0.056	1.260	33.9	0.573
40	-0.316	0.390	1.533	0.826	0.660	0.655	33.6	0.069	1.246	45.2	0.583
45	-0.202	0.537	1.420	0.679	0.620	0.695	35.8	0.154	1.161	57.7	0.590
50	-0.202	0.557	1.420	0.659	0.588	0.726	39.4	0.108	1.207	70.8	
60	-0.069	0.677	1.286	0.539	0.686	0.629	41.1	0.154	1.161		
70	-0.022	0.677	1.240	0.539	0.647	0.669	51.5	0.141	1.174		
							56.5	0.187	1.128		
							61.2	0.167	1.148		
							70.7	0.292	1.023		
							79.6	0.194	1.122		

TABLE 6-5

PRESSURE COEFFICIENT DATA, MCA STATOR B 120% DESIGN SPEED, POINT 5

% Chord	C_p 10% Span Suction Surface	C_p 10% Span Pressure Surface	S Factor 10% Span Suction Surface	S Factor 10% Span Pressure Surface	C_p 90% Span Pressure Surface	S Factor 90% Span Pressure Surface	% Chord	C_p 90% Span Suction Surface	S Factor 90% Span Suction Surface	% Chord	Hub/Mid Channel Ratio P/P_s
15	-0.618	0.391	1.822	0.814	0.410	0.893	19.2	-0.527	1.829	8.2	0.496
20	-0.598	0.278	1.802	0.927	0.314	0.989	22.6	-0.370	1.673	[illegible]	0.523
25	-0.484	0.258	1.689	0.947	0.368	0.935	24.7	[illegible]	1.571	18.6	0.535
30	-0.484	0.204	1.689	1.001	0.392	0.913	27.9	-0.136	1.439	25.8	0.539
35	-0.384	0.284	1.589	0.921	0.446	0.856	30.3	-0.010	1.313	33.9	0.546
40	-0.384	0.298	1.589	0.907	0.458	0.844	33.6	-0.016	1.319	45.2	0.532
45	-0.286	0.438	1.488	0.767	0.567	0.730	35.8	0.080	1.227	57.7	0.564
50	-0.277	0.685	1.482	0.520	0.525	0.778	39.4	0.036	1.265	70.8	
60	-0.150	0.585	1.355	0.620	0.627	0.676	41.1	0.092	1.211		
70	-0.097	0.612	1.301	0.593	0.591	0.712	51.5	0.062	1.241		
							56.5	0.122	1.181		
							61.2	0.104	1.199		
							70.7	0.224	1.079		
							79.6	0.128	1.175		